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Functional Approach to the Early Treatment of Poliomyelitis – BARTENIEFF

Development of an Objective Examination for Evaluating Physical Therapists Trained Outside the United States – GRIMM

Functional Osteology of the Foot – CARLIN

Four-Section Parallel Bars – LASH and SHULVER

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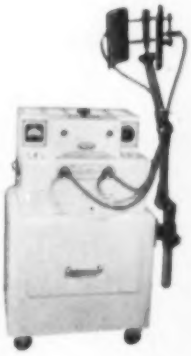

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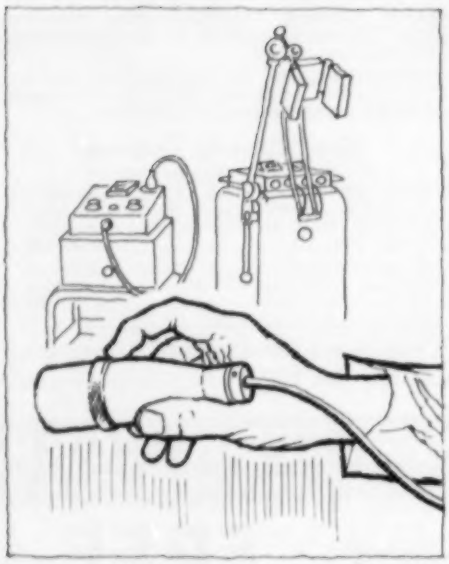

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———o———

The printers have been a little slow but by the time this magazine reaches you, all of the papers presented in Detroit, August 27, at the 4th Annual Symposium on Ultrasonics in Medicine, will be ready in a bound edition. This year the entire issue has been printed and will be distributed by The Birtcher Medical Foundation (a non-profit corporation). A copy will be sent to you without charge on your specific request.

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Vol. 35 December 1955 Number 12

Functional Approach to the Early Treatment of Poliomyelitis

Irmgard Bartenieff

Part I. Functional Stretching

Stretching of contracted muscles is considered essentially a mechanical procedure. On the whole, lengthening is effected by exerting pressure or pull on the shortened fibers. We are presenting here a somewhat different method for the treatment of muscle tightness of the early phases of anterior poliomyelitis.

Passive stretching, the standard treatment, is supplemented by a variety of methods aimed at release of tightness by inducing relaxation. To this end, we use various motion patterns with carefully graded variations of speed and force. The release of tightness becomes an active process which is more closely related to muscle re-education than is the purely mechanical method of stretching.

This paper serves primarily to outline the technic for the use of students as it has been taught to physical therapists at various New York hospitals.*

The standard stretching of tight back muscles and hamstrings uses the sit-up exercise. This, however, has proved insufficient to deal effectively with all the factors of back and hamstring tightness; therefore, some modifications have been added which are the result of a more detailed analysis of the functional patterns of the lower back, pelvis, and hip region. We will go step by step over familiar facts and amplify them with additional data.

Lying supine with flexed knees

1. In the normal person the whole back is relaxed; minimal or no lordosis of the lumbar spine is present.

2. In the polio patient, with tightness and weakness in the back and neck, the lumbar curve is exaggerated. However, whether the tightness in the lumbar extensors and in the quadratus lumborum are solely responsible for this picture *cannot* be ascertained in this position.

Reaching a sitting position from lying supine with flexed knees

1. In the normal person the back becomes gradually kyphosed as the neck extensors, the back extensors, and the quadratus lumborum relax. The pelvis tilts backward at the same rate at which the hips go into flexion.† (Figure 4.)

2. The polio patient, with tightness in posterior muscles of trunk and thigh, "hikes himself

Coordinator of Therapies, Blythedale Rehabilitation Center, Valhalla, New York

* Willard Parker Hospital, Polio Division, New York City, Medical Director Dr. G. G. Deaver; Institute for Rehabilitation, Bellevue — N. Y. University Medical Center, New York City, Course in Rehabilitation Technique, Director Edith Buchwald-Lawton; New York State Health Conference, Lake Placid, N. Y., 1953.

† Pelvis tilt *forward* means that the anterior superior spine is rotated *forward-downward*, while pelvic tilt *backward* moves in the opposite direction.

TABLE I

The Relationship of the Quadratus Lumborum to Muscles of the Back and Hip in the Three Planes of the Body

Direction of Movement	*Primary Action*	*Fixating Action*	*Antagonists of Fixating Action*	*Results of*	
				Tightness	*Weakness*
Antero-posterior	Extension of Lower Back; Synergist of lumbar portion of erector spinae in tilting the pelvis forward. Antagonists of Primary Action: Lower abdominals stabilizing the pelvis in its backward tilt.	Extension of Hip: Necessary for fixation of gluteus maximus action.	Hip flexors.	Is aggravated by weakness in lumbar erector spinae, gluteus maximus, and lower abdominals.	Aggravates tightness in lumbar portion of erector spinae, lower abdominals.
Lateral	Lateral Trunk Flexion: Synergist of lumbar extensors and lateral abdominals of same side in lateral trunk flexion.	Hip Abduction: Fixates hip abductor on same side; stabilizes pelvis on opposite side in stance of opposite leg.	Opposite quadratus lumborum; in stance opposite.	Is reinforced by weakness of lumbar extensor and lateral abdominal of same side, of hip abductor of same side, and tensor fascia lata on same side.	Aggravates tightness in lumbar extensor and lateral abdominal of same side, and hip abductor and tensor fascia lata on same side.
Rotary		Important stabilizer for trunk rotators to same side; fixates external rotation of hip on same side.	Opposite quadratus lumborum and internal oblique.	Is reinforced by weakness of opposite external oblique and same side internal oblique, by hip rotator's weakness on same side.	Aggravates tightness in internal oblique, internal rotator, and adductor of same side.

up"; the lumbar curve stays lordosed with the pelvis tilted forward. This exaggerated tilt of the pelvis is not only an indication of stiffness in the lower back, but often may be the major cause of apparent hamstring shortening in the very early stages of the disease. In the normal person the pelvis is tilted backward and the lumbar spine kyphosed. This provides the necessary fixation for efficient stretch of the hamstrings.

Evaluation

In the patient with tight back and hamstrings, or with a tight back only, the pelvis is fixed in a rigid forward tilt; thus, no proper fixation of the hamstrings can be effected. Consequently, neither a pure stretch of the hamstrings nor an exact evaluation of the degree of their tightness is possible, since the tilt of the pelvis may be solely responsible for their apparent shortening.

In order to correctly differentiate between the degree of actual shortening of the hamstrings and tightness in the lumbar region, it is necessary to *separately* evaluate the various functional factors responsible for increased forward tilt of the pelvis and for shortening of the hamstrings. This is especially necessary in the *early* stage of the disease where the picture often changes within hours, and when factors such as unbalanced distribution of weight and changed position in bed may aggravate tightness during the first two weeks.

Which are the factors contributing towards keeping the pelvis in a forward tilt? Almost all the muscle groups of the lower back and hip have multiple functions in different planes (forward flexion, lateral flexion, and rotation). As an example, a table is given showing these different relationships for the quadratus lumborum.

The factors involved are:

1. above the pelvis—tightness in the lumbar extensors and the quadrati lumborum;
2. below the pelvis—around the hip joint; tightness in adductors, tensors and hamstrings;

Figure 1, starting at upper left, reading crosswise:

1. checking pelvic tilt in supine position;
2. checking lateral tightness;
3. combination of lateral stretch and flexion;
4. relaxed passive sit-up; (note relaxed upper extremities)
5., 6. and 7. patient in last phase of hamstring tightness: patient "bobs" his knees passively by himself and follows this up by active stretch; 6. and 7. show the effect of the exercise during one treatment (6., before; 7., after this exercise).

3. in addition, weakness in all muscles opposing the foregoing ones may further increase tightness in the respective antagonists.

Analyzing tightness

It is important to differentiate between degrees of tightness in lumbar extensors, quadrati lumborum, and tensor fasciae latae. This may be done by

1. checking whether any passive tilt of the pelvis is possible by gently lifting both hips off the table. Rotation backward of both anterior superior spines should occur on the lifting, the reverse on letting the pelvis down again. If the pelvis stays rigid on either motion, any or all

three above-named muscles may be tight (Figure 1.);

2. checking the pelvic tilt passively in side-lying position with hips and knees in flexion: gently rotating the pelvis against the chest. (Figure I, 12.) By this counter-rotation the areas of maximal tightness become apparent: either close to the spine (lumbar extensors), or along the crest of the ilium (quadratus lumborum, transversalis, internal obliques) or around the anterior superior spines (tensor fasciae latae, hip adductors). This lateral check reveals whether the muscles of the lower back or of the hip are mainly contributing to the right forward tilt of the pelvis.

3. To differentiate between hip adductors and tensor fasciae, the patient is put into supine position with hips and knees bent. The knees are dropped passively to one side and brought back to the starting position. This is repeated for the other side. Again the tension around the anterosuperior spine, the lower back, and the opposite adductor becomes clearly visible. (Figure I, 2.)

Back stretching

In releasing tightness of the muscles around the pelvis, we take into consideration that all of them function in more than one plane according to their primary, accessory and guiding function. The table describing the quadratus lumborum action serves as an example of this observation.

We start the release of the pelvis by a lateral stretch. Starting the patient with this lateral motion has the advantage that the trunk is not immediately exposed to the full impact of gravity which helps the patient to relax better all over.

1. Starting position: the patient lies supine with the knees flexed. He is instructed to keep as relaxed as possible. He is carefully supported, with the neck in passive flexion, at both shoulders and at both anterosuperior spines. The feet are completely flat on the table, the knees stay flexed. If necessary, a second person may have to help maintain completely even weight distribution. The patient is carried through a full range of lateral trunk flexion from side to side. This is followed by lateral trunk flexion at 160 degrees, combined with slight trunk rotation. (Figure I, 3.)

2. Straight stretch into "sit-up" is started with the same careful support described under "back stretching"—1. Repeating it two to three times within the painfree range, watch carefully for the following signs:

a) Jerky contractions of the abdominals (particularly rectus abdominals). This indicates asymmetrical distribution of either weakness or tightness in either anterior or posterior muscles. Since at this stage the degree of either of these factors cannot be fully ascertained, complete relaxation of all the trunk muscles should be maintained at the start to avoid the secondary development of substitution patterns which ultimately result in trunk asymmetries.

b) Increased tension around the anterosuperior spine, usually medially. This indicates tightness of the tensor fascia lata *and* adductors or *either* one of them. It can be minimized by placing the legs into slight external rotation and abduction.

The passive sit-up is alternated with lateral and rotary stretches.

3. When sitting with flexed knees at 90 degrees can be passively achieved with a minimum of pain and of the signs enumerated above, the patient's *active* cooperation is asked. He is passively brought into the 90 degree sitting position with flexed knees. While full support of his back and neck is still given, he is asked to try to sit up by himself. This active attempt to keep his sitting balance elicits in most patients active contraction of the lower abdominals and hip flexor, unless, of course, there is complete paralysis. The patient is then instructed to participate in both phases of the sit-up—to be aware of the gradual relaxation of the pelvis, lower back, dorsal spine, and neck, in lying down, and of the successive contraction of neck, abdominals, and hip on the sit-up. This is repeated two or three times with quick reversal of the two phases.

As soon as some degree of participation by the patient in both phases is established, the hamstrings are included in the stretching procedure.

Hamstring stretching.

1. Starting with the supine position, the patient is brought up halfway between sitting and lying, the knees being lowered a few degrees. The whole sequence is repeated several times, the knees being lowered a little further each time.

2. When the knees can be kept at an extension of about 150 degrees while in the 90 degree sitting position, the physical therapist starts to "bob" the knees up and down. Just a few degrees of flexion are used with following release into extension. This prevents secondary tightening during the last phase of the sit-up

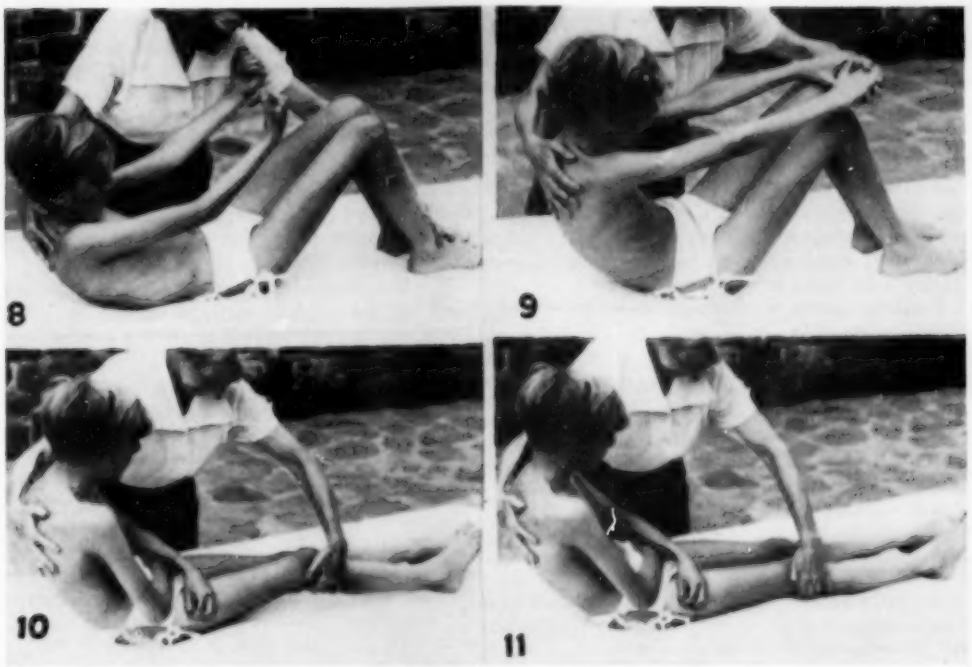


Figure I (continued)

8. undesirable "holding on" pattern of arms during passive sit-up;
9. supported "forward reach" during passive sit-up;
10. and 11. passive "bobbing" of knees during passive sit-up.

and *reinforces* hip flexion and lower abdominal contraction.‡ While the bobbing of the knees is continued, the sit-up is performed several times; sufficient support is given to prevent a recurrence of any of the other signs enumerated under "back stretching"—2. A short pause is made each time the patient is lowered to a completely supine position. As tension in the hamstring decreases through bobbing, a dramatic return in the abdominals can often be observed.

3. This exercise is now supplemented by the standard stretching of the hamstrings by straight leg raising.

‡ It has been observed in many cases that this secondary tightening of the hamstrings during the "sit-up" is part of a "substitution pattern." The patient, although supported and told to relax, during the passive sit-up tries to assist or to keep his balance. He does so by tightening the hamstrings, just as a normal person will do when perching on the limb of a tree, trying to control his balance and to "hold on" by flexing his knees. In the polio patient, this is highly undesirable substitution, because it makes the reestablishment of the normal abdominal—hip flexion pattern more difficult. "Bobbing" suppresses this tendency.

12. Rotating chest against pelvis in side-lying position to check anterior, lateral and posterior tightness above pelvis.

The role of the upper extremities in sit-up

So far, the author has pointed out the importance of full support of all body parts affected by either weakness or tightness, to insure correct sequence of either relaxation or muscle contraction. No matter what degree of support he may be given, however, the patient inadvertently will try to use his arms while sitting up. These upper extremity patterns may either reinforce existing tightness in the posterior muscles of trunk and legs, or assist toward inducing relaxation in the latter.

For this reason it is important to remember that:

1. active forward "reach" is a pattern of shoulder flexion—elbow, wrist, finger extension, and thumb abduction. It tends to *reinforce* abdominal hip flexion patterns;

2. "holding on" is a sequence of shoulder extension—elbow, wrist, finger flexion, and thumb opposition. It tends to *reinforce* extension patterns of the upper and middle back. It *increases* tension in the upper trapezius and pectoralis. The "holding-on" pattern may in many cases be severely impaired or reduced to biceps contraction only (severe deltoid paralysis and scapular involvement, for instance). Even in such cases the patient is found to "pull" himself up, a tendency which is manifested by increased tension in the neck extensors and the upper dorsal spine.

In the presence of these facts, the physical therapist should prevent "holding on" patterns at all times during the stretching procedure by

a) checking relaxed position of neck, shoulder, elbow and hand while procedure is carried out passively

b) guiding the upper extremities in a "forward reach" during assisted sit-ups in the case of deltoid triceps weakness

c) instructing the patient on "active forward reach" during active sit-up, when upper extremities are unimpaired

An equally important point is the application of the same medium speed and light force in both phases of the sit-up with a quick reversal from flexion into extension and vice versa. The patient should rest for a few seconds after having repeated the whole sequence two or three times.

Success Factors

The success of a technic such as described in this paper depends on the following factors:

1. The physical therapist needs a finely developed kinesthetic sense rather than strength in handling the patient. The accurate amount of weight-support insures relaxation in the limb while it is moved through the passive range. The correct handling of spatial patterns is more important than putting increased weight-force on a stretch.

2. This technic is only one part of an all-over program for the polio patient's release from tightness and pain. Hot packs, tanks, and a light passive range of motion of individual joints serve to supplement it.

3. This treatment is at first given only in the tank on the slightly inclined canvas stretcher. After one or two weeks it is given a second time per day on the flat treatment table.

4. Daily checking of progress is indispensable. It should be possible to observe day-by-day improvement during the first four weeks of treatment. Should a plateau be reached where the condition remains stationary for several days, a careful evaluation should be made of all the *factors* of tightness that may make a radical change of treatment necessary. Stopping the all-over treatment of back and hamstrings, and replacing it by introducing muscle reeducation of the muscles around the hip, for instance, may be indicated. (Details, such as stretching of the hip muscles separately from the pelvic-lower back groups will be described later.)

SUMMARY

A detailed description of a technic of stretching in polio is given. Based on the standard procedure of using the sit-up as the basic stretching exercise, it is modified by details derived from a functional analysis of the patterns of pelvis—hip—knee motions.

Part II. Specific Problems of Tightness

It has been shown how basic principles of active movement were applied to the relase of tightness in the muscles of the back and hamstrings. Use was made of whole body patterns and of the fact that muscle groups with multiple functions have to be stretched according to all their functional roles and over more than one joint when they are multiarticular. It has also been mentioned that many factors act upon the original pain and tightness during the first few days. Although not all of them can be clearly defined, the physical therapist is always impressed by two factors:

1. the rapid adaptation of the whole body in

TABLE II.

FACTORS INVOLVED IN DEVELOPMENT OF TIGHTNESS IN THE TENSOR FASCIA LATA.

The following factors were found either to *contribute* to or directly *produce* tightness in the *tensor fascia lata:*

Pelvis: extreme forward tilt of the pelvis causes the tensor to act as a hip flexor. Pelvic obliquity causes the tensor to act as an abductor.

Hip: All muscle weakness influencing the relationship of the greater trochanter to the acetabulum and anterior superior spine affects the tensor fascia lata.

Weaknesses

Abdominals as fixators of the pelvis in all flexor motions of the hip reinforce tensor tightness.

Gluteus maximus, causing loss of full extension of the hip as well as full backward tilt of the pelvis in standing; in addition, with the loss of the fibers that go into the fascia lata, the fascia is tightened solely by the tensor.

Quadratus lumborum: the tensor substitutes for lateral hip motions by "hiking" the hip in standing, lateral stabilization is thrown to a large extent on the fascia.

Hip abductor weakness on the same side further aggravates the conditions described under quadratus lumborum.

Iliopsoas: tensor substitutes as hip flexor.

Tightness

Hamstrings: contributory to forward tilt of pelvis; consequently, tensor tends to act as hip flexor.

Hip adductor: tightness in this group pulls the pelvis slightly medially and downward, preventing full hip extension as well as full backward tilt of pelvis.

Quadratus lumborum: increases lumbar lordosis and pelvic obliquity on same side; causes opposite tensor to substitute as hip abductor.

Internal oblique: pulls hip and pelvis medially upward, causes tensor to act as both hip abductor and flexor.

posture and individual movement patterns to pain, tightness and paralysis;

2. the protective mechanisms of tension set up by pain which so often intensify original tightness.

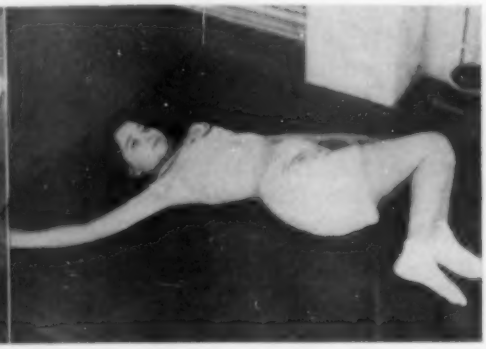
Because of the rapid adaptation of the whole body to the conditions created by pain, tightness, and paralysis, we try to stretch as early as possible to prevent some of the worst results of 1. In doing so, we meet with the problem of pain for which moist heat such as packs and warm tanks, and drugs are applied. It is usually said that early stretching should go to the limit of pain, by which is meant that the limb is carried through a range of motion until the point is reached where pain is felt. According to our functional approach, this cannot always be considered the limit of pain for a particular motion, unless the accessory guiding and antagonistic muscles have been included in the stretching procedure. In such a case we try, for instance, to alternate between the hip flexion range in which the stretching is to be carried out and the abductor-adductor range, at the same time changing the degree of either internal or external rotation of the femur. In the majority of cases, this results in a considerable increase of range in flexion. The pain may not necessarily derive from tightness in the antagonist of the hip flexor, but from tightness or muscle imbalance in a number of muscles inserted around the greater trochanter. By incorporating all the functional elements of the hip joint, it becomes possible to ascertain the *true* limit of pain. In many cases, what at first was considered the possible range within the limit of pain was increased by moving passively all functional groups around the hip joint.

Positioning

In some cases pain may be a more persistent problem, and the patient may resent even the mildest form of manipulative treatment. A complete change of regime may be indicated. All stretching is discontinued for a few days. Instead, *positioning* is given after either tank or pack treatment. The patient is placed on the treatment table and the limbs with the highest degree of tightness and pain are positioned in supportive position of maximal relaxation. Treatment

Figure II-A

1. Stretching tight abdominals in side-lying position.



2. Stretching tight obliques by positioning.

3. Positioning of a tight shoulder and biceps in the early stage of convalescence.

4. Positioning of thighs and lower legs in the early painful stage of the disease.

5. Limit of range of trunk flexion with rib cage unreleased.

6. Upward stretch and derotation of the chest.

7. Trunk flexion after release of chest.

(5, 6 and 7 illustrate one single treatment.)

starts with the tightest muscles of the limb involved which are first put into slack position rather than on even the mildest stretch. The whole limb is supported in such a way that gravity can exert no dragging pull on any part of the limb—a practice that could be equally harmful both to the tight as well as to the weakened muscle.

In the following, a few examples are given.

1. For persistent pain around the gluteal fold or posterior aspect of the great trochanter, combined with marked lordosis of the lower back, the patient is positioned as shown in figure II-A, 4. The angle of hip flexion should be defined by the limit of pain, which means that it should stay just below it. The angle of the knee should be such that the outer malleolus and the condyles of the femur are lined up in one plane.

Figure II-B

1., 2. and 3. Starting position and gradual change into abduction, external rotation, with angle of hip and knee flexion maintained.

4. Reversal of this movement into adduction, internal rotation.

5. Hip extension while going into abduction, external rotation.

6. Hip and knee extension while going into adduction, internal rotation.

2. The same effect may be obtained in a side-lying position. (See figure II-A, 1.)

3. In the upper extremity, pain in the rotator groups may be relieved by positioning as shown in figure II-A, 3.

Note especially the careful positioning with sandbags all around the shoulder area and the minimal angle of elbow flexion.

Timing of Positioning

All positions are held not longer than five minutes each, and several different ones may be given during one treatment period. From the beginning, for all patients with weak abdominals and neck flexors, the head of the bed is raised to an angle of about 30 degrees, for periods of one-half to one hour, several times a day. It is important that patients with severe lordosis and shortening of the back muscles be arranged in bed in such a manner that the pelvis is fully supported by the incline of the raised portion of the bed. This position neutralizes the exaggerated pull of gravity concentrated on just the ischia. Needless to say, in these cases, the footboard has to be adjusted accordingly.

In spite of closest attention to and successful treatment of these two factors during the first few weeks, within the later stage of the disease as the patient becomes more generally relaxed some particular problem of tightness will become more intensified. This is frequently the case in patients with weaknesses distributed over the extremities and the trunk. It may become a major problem not during the first four weeks, but after the acute phase has ended.

Among the more outstanding problems are those of the tensor fascia lata and of the abdominals, which will be discussed in the following.

Tensor Problem

Table II enumerates the various factors that have been found clinically to contribute to, and aggravate, tightness in the tensor fascia lata. It shows that tightening of this very small muscle is prone to occur because of its peculiar anatomical position. It is functionally linked up with flexor and extensor muscles on the one hand, and with the abductor and rotators of the hip on the other. It can be observed again and again that a bed patient, with weaknesses around the hip, will contract the tensor when attempting to shift his weight or to roll on his side. Tensor tightness is linked with adductor tightness, when the adductors are good or normal in strength and the abductors are weak. In stretching, therefore, we found it necessary to include in one procedure as many muscles around the hip as possible, while keeping constant the relationship between the greater trochanter and the anterosuperior spine of the pelvis. The series of illustrations shows that slightly different combinations of hip and knee motions are used successively.

1. Beginning with hip flexion, internal rotation, and knee flexion, the thigh is gradually brought into abduction and external rotation, while the angles of hip and knee flexion are maintained. (Figure II-B, 1, 2 and 3.)

2. The movement is reversed into adduction and internal rotation, without changing the hip and knee angles. This movement is repeated two or three times. (Figure II-B, 4.)

3. Movement 1 is repeated, but instead of reversing it as in 2, the hip is stretched into extension while going into adduction and internal rotation. Repeat two or three times. (Figure II-B, 1, 2, 5, and 6.)

4. Starting again as in 1, both hip *and* knee are fully extended, when maximum abduction and external rotation have been reached, and lowered into adduction—internal rotation. (Figure II-B, 1, 2, and 7.)

5. The reversal of 4 leads into hip flexion, internal rotation, adduction, and knee extension. This results in maximal stretch of the hamstrings, provided some degree of relaxation of the adductors and the tensor has been achieved. (Figure II-B, 8.)

Tightness of the Abdominals

Only in rare cases is tightness of the abdominals a problem of the early stage of the disease. As long as there is stiffness in the back muscles, a definite muscle grading of either the abdominals or the back muscles cannot be made. The problem becomes marked as the tightness in the back diminishes and the patient is able to sit up by himself. A greatly exaggerated general kyphosis of the whole back, when sitting with either straight or flexed legs, may be indicative of abdominal tightness, if the patient is unable to completely reach his toes. There may be minimal hamstring tightness, as tested by straight leg raising, which is a further indication that the tightness is not located in the posterior muscles.

Here again the side-lying test described in the first article is most helpful in detecting in which portions of the abdominals the tightness is located. The patient lies on his side with the legs in hip-knee flexion. The pelvis is rotated with a firm grip on the anterior superior spine and the trochanter, while the ribs are rotated in the op-

Figure II-B (continued)

7. Hip and knee going into extension, while limb is brought into adduction, internal rotation.
8. Full stretch on hamstring by full hip flexion in slight external rotation.

posite direction. (Figure II-A, 1.) This procedure clearly shows that and where the rib cage is fixed by tightness. This is one way to release abdominal tightness, and is particularly effective when this tightness is unilateral. Another way to free the ribs fixed in this way is by diagonal and rotary stretching, instead of by straight longitudinal lengthening of the trunk only. Illustrations II-A, 5, 6 and 7 show this combination of rotary and longitudinal stretching in the sit-up. It should be noted that the physical therapist, kneeling behind the patient, exerts a mild forward-upward pull, while the patient is slowly brought up to a sitting position. By shifting this pull more towards one side of the back or away from either of the arms of the patient and away from the physical therapist, the latter can vary the degree of rotation exerted on the dorsal portions of the spine.

Positioning can also be used for diagonal stretching of the obliques. (Figure II-A, 2.) Here the patient lies in a supine position with both knees flexed and the feet placed on the floor. One arm is placed diagonally overhead (midway between 90 degree abduction and 180 degree shoulder flexion). Both knees are dropped in the opposite direction of the arm. This exerts a diagonal stretch on the obliques. After 5 minutes, the position is shifted to the opposite side and the whole procedure is repeated. These 15 to 20 minutes of passive stretching are repeated two to three times a day, so that some carry-over into all the other exercises and activities is established. As long as the patient is unable to relax the abdominals, he is on a restricted program of sitting and standing, and no active trunk flexion exercises are given.

Timing of Treatment

In addition to the accurate and varied use of stretching, the timing of treatments is of great importance. In particular, several short treatments distributed over the day are liable to guarantee a better carry-over from one day to the next.

SUMMARY

It should be reemphasized here that, before embarking on one particular technic of releasing tightness, frequent careful reevaluations of tightness and weakness are indispensable. As stretching goes on over several days or weeks, a point may be reached where muscle reeducation, exposing the patient to standing and sitting, may be more effective for eliminating the last traces of tightness and pain. Because of functional interdependence of various muscle groups, stretching of one group may aggravate tightness in other groups. (See table I on quadratus lumborum and table II on tensor fascia lata.) Therefore all measures should be carefully weighed against one another. By shifting the emphasis every few days from active muscle reeducation to stretching and positioning or vice versa—instead of just either increasing or decreasing the amount of stretch on one particular muscle group or joint—it becomes possible to gradually eliminate or minimize aggravating factors. When several methods are available to release tightness, any one or all of them may be right at different stages of convalescence in one person. In other cases, only one of them may have to be chosen, because any of the others may aggravate tightness in other muscles of the same functional unit.

Part III. Stretching the Upper Extremities

When it comes to the early treatment of shoulder tightness in poliomyelitis the points made previously for the lower back and the lower extremities can be applied with even greater emphasis to treatment of the muscles of the shoulder and scapula, and shoulder and elbow-hand respectively. In restating them we want to underline the complexity of the tightness problem as well as the functional complexities of upper extremity movements as they occur in our daily activities.

The factors intensifying the original pathology are:

1. rapid adaptation of the whole body to local disability
2. postural influences of prolonged bed rest
3. pain developing protective muscle tightness
4. multiple functions of muscles in more than one plane
5. reversal of roles in multiarticular muscles.

Our findings in regard to points 1 and 2 are that only in very few cases is shoulder-arm-hand involvement an isolated pathology. In parts I. and II. it has been pointed out that a general tightness of the back, neck, and the legs is reinforced by upper extremity involvement. By the same token it should be restated here that stretching of the back and positioning greatly influence the status of the shoulder-elbow-hand tightness problem.

Point 3, the problem of pain, shows that a careful, cautious checking of the main weakness, tightness and pain, should precede any treatment. Pain in the upper extremities aggravates tightness possibly to a greater extent than pain in the lower extremities. Several reasons account for this since many more muscle groups are involved, and the patient is more liable to protect himself by defensive muscle tension against being touched or handled. A perfectly neutral grip in handling the extremities should be used. All joints should be supported at all times. Any gripping, pulling, or pushing should be avoided, as they may elicit these protective muscle tensions.

In dealing with pain, the patient—from the very beginning—should be made an active participant of the whole procedure of stretching. He then will no longer resent stretching as a measure inflicted upon him. He will help to "work out" the pain with the physical therapist. This can be brought about by various measures, such as the following:

1. In *stretching tight biceps brachii*, for instance, the lower arm is extended to the point where pain is felt and is then immediately lowered just a few degrees below that point. The limb is fully supported by the physical therapist in this position; gradually the whole extremity relaxes. Always the forearm is first *flexed completely passively*, and then it is quickly and gently brought into extension, but without even a suggestion of pressure. As a rule, the range of extension is found to have increased beyond the former limit. By repeating this procedure two or three times, increases in range often can be achieved. The visible result, nearly painlessly obtained in one treatment, gives the patient reassurance and lessens his attitude of *anticipating* pain.

2. The *use of reflectory mechanisms* in the superficial tissues is another means of alleviating pain and tightness with minimal strain to the patient. While undisciplined, indiscriminate touch by the physical therapist may elicit undesirable contraction in muscles which in turn spreads to adjoining areas, release of tightness can be brought about by superficial stroking of the skin over areas of either pain or tightness. This stroking can be varied from just slightly brushing the skin with one finger tip to moderately strong friction applied to superficial and subcutaneous tissues. Particularly the area around the tendons of tight muscles responds to this procedure. Many patients complain about the "line of pain" which is strictly limited to a thin line extending from the acromion over the midportion of the lateral deltoid. It is most acutely felt with the arm in abduction and external rotation. The finger of one hand slightly brushes along this line, as the other hand moves the humerus into abduction while constantly increasing external rotation.

3. *Functional patterns of the shoulder-arm area.* Clinical observation of the development of tightness and of functional loss is supported by the finding of Inman who investigated the function of the shoulder girdle with the aid of electromyography. Whether stretching or reeducating, the physical therapist has to consider at all times and simultaneously the four functional elements of scapulohumeral movement in abduction and flexion of the arm. These four elements are:

Figure III-A

Left column reading downward:

1. neutral grip controlling simultaneously hand, fingers and elbow—lower arm—upper arm (over condyles of humerus);
2. checking tightness in upper trapezius;
3. tendon stroking for release of tightness in pectorals;
4. tendon stroking for release of tightness in teres group;
5. the "line of pain" in middle deltoid.

a) The scapular muscles, which are functionally grouped as follows:
   (1) rhomboids and middle trapezius
   (2) upper trapezius, levator scapulae, upper portion of the serratus anterior
   (3) lower trapezius and lower portions of the serratus anterior
b) The clavicular group, consisting of pectoralis major and minor
c) The depressors of the humerus, meaning the subscapularis, teres major and infraspinatus
d) The rotators of the shoulder

Inman and his workers have found that though all the muscles of the scapula, clavicle, and humerus are active through all phases of shoulder flexion and of shoulder abduction, the maximum peak of contraction is reached at different phases. Also, that some muscles have their maximal contraction at a different phase in either flexion or abduction of the arm. These two facts are applied in the technic of "stretching in sequence."

The first essential requirement of the technic is to alternate between flexor and abductor movements of the humerus. This serves to stretch different parts of, and to a different degree, the pectorals and depressors of the humerus. At the same time, varying degrees of internal and external rotation, respectively, of the humerus are used in conjunction with abduction and flexion. Since the scapular muscles have a somewhat different sequence in either abduction or flexion, the danger of static secondary cocontractions is thus minimized.

Figure III-B

Left column reading downward:

1. controlling rotation of upper arm with acromion fixated;
2. controlling rotation of upper arm from condyles of humerus while releasing tightness in rotator groups;
3. checking range of shoulder rotators by fixating humerus, at the condyles, with humerus in flexion of 90 degrees;
4. tendon stroking to release tightness in biceps humeri;
5. tendon stroking of elbow flexors in pronation.

The second essential requirement is to include as many joints of the extremity as possible in one successive stretch. Here again the aim is to minimize pain and to prevent secondary tightness in either accessory or scapular muscles. It is most effectively carried out by using straight abduction and straight flexion, alternating with various diagonal and spiral patterns of the whole extremity as described in the sequences that follow. In this manner the limb is kept in a constantly smooth-flowing motion which, in turn, produces a rhythmical, successive stretch on the muscles of each of its joints. Therefore it also reaches all the multiarticular muscles over the joints they control. In deltoid weakness, for instance, it can frequently be observed that the biceps brachii tightens when the humerus is even passively carried through a range of abduction. The cause for this cocontraction may be twofold: the biceps, in its function as synergist to the middle deltoid, is stimulated or contracts as part of a defense mechanism against pain in the shoulder. Biceps contraction may be further reinforced when its antagonists at the elbow, the triceps, is weak. Thus it is found that in the multiarticular muscle groups, factors from either of the joints they control, may be responsible for prolonged tightness.

The physical therapist should aim at eliminating or minimizing as many of these factors as possible in one procedure. This will give him a better chance to prevent cumulative effects of

Figure III-B (continued)

6. Checking range of rotators in severely disabled patient; lateral border of scapula, outer condyle of humerus are supported.

7. Releasing tightness in pectorals at 90 degree abduction; fixating hand supports humerus at condyles; lower arm and hand are supported by wrist of therapist in this severely disabled patient.

several forces acting concomitantly upon one muscle group. When carried out in a smooth rhythm (waltz or three-quarter time), the patient usually follows willingly all these movements. Severely disabled respiratory patients, who are particularly sensitive to being handled, have done especially well with this technic. They no longer dread stretching, and in many cases the same patterns prove to be effective also for stimulating active function in trace muscles. With most patients with very severe scapulohumerus involvments, it is possible to keep the range of rotation free at all times, while flexion and abduction remain stationary at just below 90 degrees.

STRETCH SEQUENCES

In the following we present the sequences to be observed in straight and spiral stretch, respectively.

a) Straight stretch

(1) Flexion to the point of pain with slight external rotation (once).
(2) Abduction with slight internal rotation to the point of pain (once).
(3) With humerus in slight abduction (below limit of pain) the physical therapist slightly brushes skin area over the tendon of the pectoralis major and the teres group (two or three times).
(4) Repeat (1) and (2).
(5) Bring arm into maximum pain-free range of flexion with slight external rotation; hold limb well supported just below point of pain. When patient relaxes, bring it gently beyond limit of pain. Repeat once or twice.
(6) Repeat (3), (4) and (5) for abduction.
(7) Shift to biceps: start with "stroking" lightly the skin area over the biceps tendon, follow by increased passive flexion, then quickly reverse into extension-supination. Repeat once or twice.
(8) Return to shoulder abduction, this time varying the degree of external and internal rotation accompanying the passive abduction.
(9) Follow up with stroking of skin area over teres group.
(10) Starting with shoulder flexion, reverse (8), followed by repetition of (9).
(11) Repeat biceps procedure.
(12) Have patient rest for at least one minute before repeating the whole sequence.

b) Spiral stretch

(1) Starting with shoulder abduction at an angle of 45 degrees, the arm, in slight internal rotation, is carried in a wide arc diagonally across the body to the opposite side, changing to shoulder flexion, adduction, external rotation, elbow flexion, supination-wrist-ulnar flexion, finger flexion (starting at the fifth finger), adduction, thumb opposition.

(2) Reverse this movement, returning along the same path to shoulder abduction in internal rotation, elbow extension, pronation, wrist ulnar extension, finger abduction, extension, thumb fully abducted.
(3) Starting in slight abduction, guide the arm through a "figure eight" across the chest to the opposite side of the head and back to the hip, ending in 90 degree abduction.
(4) Joint motion and rotation as described in (1) and (2) are incorporated in this movement.
(5) Alternate movement (3) with a smaller arc starting at the elbow and leading into elbow flexion, supination, wrist-ulnar flexion, finger flexion, thumb opposition, and reverse this movement ending in full 90 degree abduction.

The illustrations, it should be noted, show that control of the four joints of the extremity can be exercised only if the main guiding force is exerted at the condyles of the humerus. Only in this manner can rotation be gradually spread from the shoulder to the other joints, blending in supination and pronation, respectively, at elbow and wrist, while moving the whole arm in a wide arc.

The physical therapist can produce this movement only by observing that his *own* arm moves from the shoulder and is not stationary at any time during this exercise.

SUMMARY

The use of functional patterns for release of tightness is described for the shoulder and arm areas. Various measures to alleviate pain and minimize secondary protective pain tension are discussed. The functional considerations of the technic is based essentially on the Inman concept of shoulder function. A detailed description of straight and spiral patterns used in stretching is presented.

It is emphasized that variety of manipulation is more important than the use of force.

The author wishes to express her appreciation to Dr. A. D. Gurewitsch, Medical Director and in charge of physical medicine at Blythesdale, Valhalla, N. Y., for his kindness in critically going over this work and assisting in writing this paper.

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Examination for Physical Therapy Licensure in Pennsylvania

The State Board of Medical Education and Licensure of the Commonwealth of Pennsylvania announces that its next examination for physical therapy licensure will be given in Philadelphia on January 23, 24, and 25, 1956. Application for the examination should be made as soon as possible to:

Department of Public Instruction
Bureau of Professional Licensing
State Board of Medical Education and Licensure
Box 911
Harrisburg, Pennsylvania

Illinois Examination

The next examination to register physical therapists in Illinois has been scheduled for December 16, 1955. Applications from physical therapists who wish to take the examination will be accepted until December 1st and should be addressed to

Department of Registration and Education
Division of Physical Therapy
Springfield, Illinois

The examination will be given in the State of Illinois Building, Department of Registration and Education, 160 North La Salle Street, Chicago.

Development of an Objective Examination for Evaluating Physical Therapists Trained Outside the United States

Elaine R. Grimm, Ph.D.

Professional organizations and certifying bodies in this country are constantly faced with the problem of evaluating the qualifications of those who have received their professional training outside the United States and who now wish to practice in this country. The accurate assessment of professional education and experience is, in itself, a complex problem, but it becomes even more difficult when most of the usual familiar standards do not apply. Differences in language, professional standards, and technics from one country to another, as well as lack of intimate knowledge of the adequacy of school curricula and work experience, add to the complexity of the problem. The method most commonly used by professional organizations to evaluate training received abroad has been to accept individuals on the basis of their graduation from "approved" schools or membership in "approved" organizations in other countries. Maintaining an accurate, up-to-date system of accreditation is usually a monumental task for any professional organization. Even more important, such a procedure does not take into account the wide range of individual differences among persons which exists, and the progress, or lack of it, which they make after they have met the minimum qualifications of schools or organizations. A much more satisfactory procedure, therefore, is the assessment of the competence of *individuals* at the time they apply for membership.

The American Physical Therapy Association has been faced for a number of years with the task of determining whether physical therapists trained outside the United States are qualified for membership. This responsibility is a serious one, since membership implies to employing agencies and the public that certain standards have been met and that the person possesses competency in the field of physical therapy. In 1954 the American Physical Therapy Association made the decision to use a written objective examination to be given to physical therapists trained abroad who apply for membership in the Association.

As a result of the collaboration of the Association and the Professional Examination Service on the development of an objective examination for the use of state boards in licensing physical therapists, a set of specific procedures had been worked out and a file of multiple-choice examination questions had been developed.* It was decided that the same procedures and the same Advisory Committee on Examinations, appointed by the American Physical Therapy Association from its membership, would be used in developing the new examination.

Construction of the Examination

A previous article cited above describes in detail the specific methods employed in constructing the examination. The Advisory Committee decided to use approximately the same number of questions and the same outline, with minor modifications, which had been agreed upon for the licensing examination. While many questions already in the special file were considered appropriate for this examination, approximately one-third were written and processed especially for this purpose. Every effort was made to use simple language, to omit questions pertaining to relatively unimportant specialized technics used only in this country, and to give alternate names for structures or technics if any possibility of misunderstanding could arise. The main aim in selecting these questions was to cover all the basic material which a competent candidate should be expected to know without unduly penalizing him for regional differences in terminology or technic.

The examination includes questions on all the subjects required in the physical therapy curriculum as established by the Council on Medical

Assistant Director, Professional Examination Service, American Public Health Association.

* See Reference 1.

Education and Hospitals of the American Medical Association. The subjects covered are:

Basic Sciences

Anatomy, Chemistry, Kinesiology, Pathology, Physics, Physiology, and Psychology.

Clinical Sciences

(as related to physical therapy) Internal Medicine, Neurology, Obstetrics and Gynecology, Orthopedics, Pediatrics, Psychiatry, and Surgery.

Physical Therapy

Administration, Electrotherapy, General Knowledge (braces, equipment, bandaging, aseptic technic), Hydrotherapy, Massage, Medical Ethics, Radiation Therapy, and Therapeutic Exercise.

While the general procedures of administration and statistical treatment were essentially the same as those used with the physical therapy licensing examination, some special problems had to be faced in this case. The situation was different in that the examination was to be given and used by the American Physical Therapy Association. The Association, rather than the state licensing boards, therefore, had the responsibility for deciding what standards candidates for membership should be expected to meet and where the passing point of the examination should be set. It was vital to have some basis for comparing the physical therapists who had been trained abroad with those trained in this country in order to set these standards. It was, therefore, proposed that the examination be administered to a group of no less than 100 physical therapists who would be representative of those educated in the United States. The question of representativeness was the important one. Although it would have been desirable to administer the examination to physical therapists who had been in practice for several years, since they would probably be most directly comparable to the candidates from other countries, there was no way of obtaining such a representative sample. If volunteers had been called upon to participate in the pre-test, there would certainly have been a selective factor involved and there would have been no way of knowing how representative of American physical therapists those who volunteered were. For example, it is possible that too great a number of volunteers would have been especially well qualified people whose performance on the test would have led to the establishment of unrealistically high standards. It would obviously be impossible to expect any large group of those in practice to take a day-long examination on any other than a voluntary basis. The Committee, therefore, decided to try to obtain the cooperation of several schools in administering the examination to *all* their graduating students. The fact that this method would yield a fair sampling of physical therapists of all ranges of ability was an advantage far outweighing the disadvantage that they had not had as much work experience as the group with which they would be compared. It would be difficult to say who would benefit more from the difference in background; while the candidates for membership had had more working experience, the students were closer in time to their formal training.

Five schools which were selected by the Committee agreed to cooperate on this project and administer the examination to all the students in their current graduating class during the period of August-October, 1954. Each school tested about 20 students, with the result that a total of 105 students participated in the pre-test. The examinations were graded and analyzed by the Professional Examination Service.

Results of Pre-test

In the first column of table I are presented the average scores of all the students on the parts and on the total examination. These are the data which will serve as norms against which to compare the candidates for membership in the Association. From this column, one can see, for example, that the average score on the total examination was 203.67 or 67.89 per cent of the 300 questions, that the scores ranged from 154 to 254, and that (as determined from the σ, another measure of variability) roughly two-thirds of these students obtained scores between 182 and 225 (Mean $\pm$ 1σ). Similar information has been given for each part of the examination.

By looking at the average per cent scores one can see that the examination had been pitched at an appropriate level of difficulty and was hard enough to be discriminating. We had wished to obtain average per cent scores around 60 to 65 per cent since this would be difficult enough to be discriminating but not too difficult to be discouraging to candidates. Part 3 proved to be slightly easier than had been intended. Part 2 is the most difficult section, and Part 1 falls between the other two. (It is, of course, impossible to tell whether the Committee selected easier questions

TABLE I

AVERAGE EXAMINATION SCORES OF STUDENTS AND CANDIDATES FOR MEMBERSHIP

	Students (105)	Candidates for Membership (22)
Part 1—Basic Sciences (110 items)		
Mean	71.49	66.50
σ	8.91	13.72
Range	53-89	31-93
Av. %	64.99	60.45
Part 2—Clinical Sciences (55 items)		
Mean	33.12	33.95
σ	5.51	5.50
Range	18-49	24-48
Av. %	60.23	61.74
Part 3—Physical Therapy Theory & Procedures (135 items)		
Mean	99.06	93.45
σ	10.43	14.64
Range	73-123	67-121
Av. %	73.38	69.23
Total Examination (300 items)		
Mean	203.67	193.91
σ	21.55	30.40
Range	154-254	130-239
Av. %	67.89	64.64

for Part 3 and harder ones for Part 2 or whether this represents a difference in the preparation of the candidates.) Each of the distributions has a rather wide range of scores, which is desirable and indicates that the examination effectively differentiates the abilities of the students.

Table II shows the intercorrelations of the parts of the examination. These correlations indicate that the sections of the examination are highly related to each other, as one would expect, and that a student who obtained a high score on one part would, in general, tend to score fairly high on the other parts. The correlations also indicate, however, that each part of the examination is measuring something unique and is contributing additional information to the total picture of the students' competence.

TABLE II

INTERCORRELATIONS BETWEEN PARTS 1, 2 AND 3 OF THE EXAMINATION

	Part 1	Part 2	Part 3
Part 1		.69	.59
Part 2			.65

There were no significant differences among the scores of students from four of the five schools participating in this project. However, the average scores of students from the school designated as School A were significantly lower than those from each of the other schools on all parts of the examination.

The reliability of the entire examination is .89 according to the Kuder-Richardson Formula No. 20, which tends toward underestimation. This is an acceptable degree of reliability.

In order to determine how valid the examination is, i.e., to what extent it actually measures knowledge of physical therapy, the examination scores were correlated with the grades the students had obtained in the schools of physical therapy. The resulting correlations are presented in table III.

TABLE III

CORRELATIONS BETWEEN SCHOOL GRADES AND SCORES ON THE EXAMINATION

	Schools				
	A	*B*	*C*	*D*	*E*
Part I (Basic Sciences)	.55	.50	.84	.82	.60
Part II (Clinical Sciences)	.25	.33	.57	.45	.62
Part III (P.T. Proc. & Tech.)	—[1]	.48	.54	.59	.84
Total	.62	.52	.88	.84	.86

[1] Not enough information on grades available to determine this correlation.

Course grades were grouped and averaged, so that for each student there were four grade-point averages — his average for courses in the basic sciences, courses in the clinical sciences, courses in physical therapy technics and procedures, and his total grade-point average. Each of these averages was correlated with the corresponding grade on the examination. Since systems of grading varied so widely from school to school, the results were computed separately for each of them. The correlations in table III are, in general, high and, with the exception of the three lowest correlations in clinical sciences, are highly significant ones (at least three times their Probable Error). There is no doubt that the examination is valid and measures, to a considerable extent, the same abilities upon which the students have been graded by the faculty of the physical therapy schools. This is especially important information to have in comparing candidates for membership in the Association with these pretest scores. Since there is such a high degree of relationship, we can be fairly certain that the score a candidate obtains on the examination reflects fairly accurately how he would be graded by the faculty of an American school of physical therapy. The great advantage of the examination is that in one day of testing one can obtain an assessment of a candidate which is reasonably close to that which might be made after more than a year's acquaintance with his abilities.

Setting a Passing Point for Candidates for Membership

In using the results of the pre-test as norms for evaluating physical therapists trained outside the United States, the main purpose was to have a basis for determining the passing point or the minimum standard for acceptability as a member of the American Physical Therapy Association. The "passing point" is an arbitrary one since it is not possible to determine at exactly what point on the distribution of scores an "acceptable" physical therapist can be distinguished from one whose work is "unacceptable." It was the responsibility of the Advisory Committee to determine the standards it wanted to use in comparing physical therapists trained abroad with those trained in this country. The Committee decided that a candidate would be expected to obtain a satisfactory score on each of the three parts of the examination as well as on the examination as a whole and that the same relative standard would be set for each part. The procedure used to set such a standard was to consider the distribution of pre-test scores. While the passing point could conceivably have been considered to be the average score for physical therapists trained in this country or immediately below the lowest score obtained, there seemed to be little doubt that the former standard was too high and the latter standard too low. In order to take into account differences in difficulty level and variability among the three parts of the examination, σ (standard deviation) units were used to define the scores at which the passing point could be set. The Committee was then asked to decide whether it would require candidates to reach a score of -1σ, -1.5σ, or -2σ below the average of the pre-test group. Stated another way it was to consider: at what level will a physical therapist trained abroad be considered "unacceptable" for membership — if he is surpassed by 63 per cent (-1σ), 93 per cent (-1.5σ) or 98 per cent (-2σ) of the physical therapy students trained in this country? The Committee unanimously decided to use the middle criterion, and to set the passing point for each part of the examination at a score 1.5σ below the average of the pre-test group, so that any candidate whose score was poorer than that obtained by 93 per cent of the students would be considered to have failed.

Procedure and Results of Administration to Candidates

Physical therapists who received their education outside the United States and who are active members in good standing of selected member organizations of the World Confederation for Physical Therapy are eligible to apply for membership in the American Physical Therapy Association. Before admission to the qualifying examination a candidate must make formal application, including payment of a fee of $5.00 to the Association, and demonstrate that he has satisfactorily completed a minimum of one year of employment in a physical therapy department approved by the Association under the supervision of a member. The Association is willing to offer any help or guidance needed to complete these requirements and, when they are fulfilled will make final arrangements for the candidate to take the examination individually at the nearest appropriate place which is convenient for him.

The Professional Examination Service sends the designated proctor the question booklet, answer sheet, and manual of instructions for administering the examination. After the test has been given this material is returned by the proctor, and the examination is scored. The results are reported to the American Physical Therapy Association and candidates are notified approximately one month after the date of the examination. If a candidate fails two or more parts he may take another examination after six months from the date of the first; if he fails only one part he may take only that section of the examination after six months.

Up to the present time 22 candidates have taken the examination. Their results are presented in the second column of table I and can be compared with those for the pre-test group. In general, the candidates' averages are slightly lower than the students', and there is more variability among the candidates' scores, as one would expect. These differences in averages and variability are not significant, but no definite conclusion can be drawn until a large number of candidates have been tested. If these differences persist when the groups being compared are of approximately equal size, some of them will undoubtedly be significant. The candidates for membership scored a little higher than the students on Part 2, Clinical Sciences, which is to be expected since they have had more clinical experience. To date 13 candidates passed the entire examination the first time it was administered to them. The Association welcomes well qualified physical therapists from other countries to membership in the Association if they meet the specified standards. Candidates are encouraged to request guidance from the Association in preparing for

the examination and unsuccessful candidates are given suggestions for helping them to pass the examination the following time.

As in the case of the state licensing examination, the Association and the Professional Examination Service have had the whole-hearted cooperation of a large number of physical therapists throughout the country in the development of the examination, as well as the invaluable assistance of the faculty and the students of the five schools of physical therapy who took part in the pretesting. Those who have participated in this program have reason to feel proud of the role they have played in pioneering the objective evaluation of members of their profession trained in other countries.

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Functional Osteology of the Foot

Eleanor J. Carlin, M.S.

To understand and appreciate how and why various parts of the body function, we first must know some details of the structure. While descriptive anatomy is, in a sense, the blueprint of the mechanism, a knowledge of shape and structure alone is not sufficient. Only when we question the *reason* for specific formations of bony units and interpret their presence in the light of function can such knowledge be of value. The following brief discussion of some of the important areas in the human foot is presented in an attempt to show how an appreciation of the logic of structure can give us increased understanding of how and why it works as it does.

A study of the whole foot reveals a heterogeneous collection of bony units which must provide both stability for weight-bearing and motion in several planes. The seven tarsal bones, five metatarsals, and fourteen phalanges exhibit to a remarkable degree a functional compromise between their two previously mentioned functions. The effect of this compromise on individual bones will be discussed later, but it is useful first to consider the whole foot and its ability to provide a base for the body and a means for locomotion.

It is clearer to think of both feet as a single unit forming an irregular dome whose edges comprise the structural basis for support. Briefly, this rim is composed of the calcanei, the heads of the first and fifth metatarsals, and the entire phalangeal unit. The roof of this dome appears mainly on the medial aspects of the feet in the two longitudinal arches. To fully understand the ability of the foot to support the body weight we must think of this construction as a *series* of arch-like supporting mechanisms radiating peripherally from the highest point of the arch. It is not unlike a coffee-cup, which, when turned upside-down can withstand a remarkable load in contrast to its fragility when it is in the customary position.

In respect to the motions possible by the whole foot, it should be remembered that every bone is capable of motion but that it is a cooperative activity which results in the movements we can observe. These will be elaborated in the discussion of individual bones, but a brief review of the normal kinds of motions may be of value. Excluding the individual interphalangeal joints, which provide simple flexion-extension, the foot motions can be divided into three parts. First, there is the simple flexion-extension motion of the talotibial joint; second, the complicated eversion-inversion possible at the mid-tarsal region; and, third, the condyloid motions of the metatarsophalangeal joint. The variation in the complexity of these motions is one of the most evident factors observable in the structure of individual bones. Here is where we can see, perhaps most clearly, why each bone has assumed its specific shape and understand the meaning of the osteological evidence.

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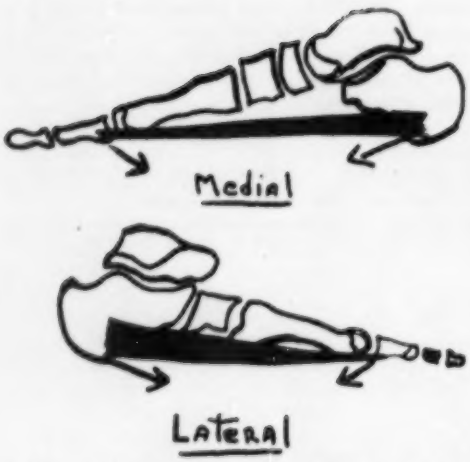

Figure 1. Showing the pull of the abductor hallicus and abductor minimi digiti across the longitudinal arch.

The Talus

The true connection between the leg and foot occurs at the talotibial junction. Here the tibia and *every other part of the body* rests its weight on one bone. The important factor here is that the talus must not only provide a stable surface for support but must also be shaped for motion both superiorly and inferiorly. An examination of the superior surface of the talus clearly indicates that motion takes place here in only one plane. Shaped as it is like a broad rocker, it reflects the simple anteroposterior excursion of the tibia as well as the weight transfer from the leg to the foot.

It is the inferior surface of this bone, however, which tells us of the additional functions of which it is capable. Were tibiotalus motion and support the only functions, it is likely that the talus and calcaneus would be fused. Certainly this would increase the stability without any sacrifice of ankle motion. Instead we find not only one but two distinct articular surfaces between the talus and calcaneus. Furthermore, they are not alike and their different characteristics indicate an important functional compromise between stability and motion. The posterior junction located *directly* in the weight-bearing line is an interlocking mechanism which permits only slight motion but provides needed stability. The anterior junction, however, is shallow and freely moveable, reflecting the important part played by the talus in the motions of inversion and eversion. By means of this double articulation, the distal aspect of the talus is free to move both sideways and upward in a curved line of motion while, at the same time, being held to the weight-bearing line by the pivot-like posterior talocalcanean articulation. Obviously the talus fills a key position in the foot. Were any additional duties required of it, it would be at the expense of other jobs. Consequently we find here the *only* bone in the foot upon which no muscle attaches. Thus additional pull, motion, and stress is eliminated.

Calcaneus

The calcaneus also has a double function and clearly demonstrates this in its formation. First, it is the foundation of the foot and secondly it functions as a solid, stable unit for muscle attachment. Its primary purpose is clearly evident from its size and cuboid shape. It presents a broad platform to accept the load transmitted through the talus and thence to the ground. Being the first contact point in the important foot function of walking it is also smoothly rounded on the posteroinferior corner as a result of rotating under the moving body weight.

The lateral and medial aspects of this bone show best the results of muscle attachment and function. Here are attached the adductor muscles of the first and fifth digit so important to the maintenance of the longitudinal arch. When the body weight is applied to this dome-like structure, there is a marked tendency for it to flatten and depress. The adductor muscles resist this, however, by attempting to approximate the calcaneus, metatarsal and phalangeal bones, and this powerful pull is evidenced by the large, bony masses which appear on the lateral and medial calcaneus. (Figure 1)

The inferior surface also demonstrates the result of weight bearing. The marked lipping of the tuberosity and the bulbous impression immediately in front reflect the great stress applied by the flexor digitorum brevis and the quadratus plantae. Since both of these muscles also contribute to the maintenance of the arch, their presence is clearly indicated.

It is not alone the direct attachment of muscle which is reflected on this bone for it also shows the result of the passage of the great flexor tendons. These include principally the tendons of the flexor hallucis longus and flexor longus digitorum. A deep, wide groove is present on the bone's medial surface, having definite impressions of erosion caused by pressure. A consideration of the mechanics of the ankle joint will

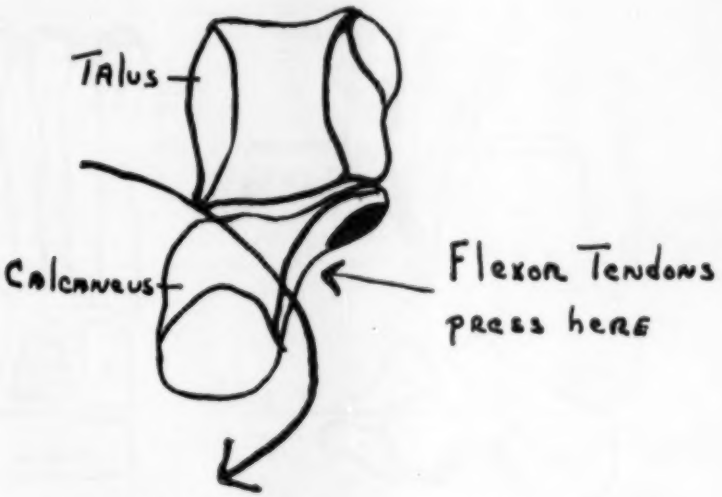

Figure 2. Medial rotation of calcaneus counteracted by passage of the long flexor tendons.

explain this easily. These muscles must, to exert their power on the foot and toes, describe a right-angle turn around the malleoli. Just as a rope or wire which supports a moving object will wear grooves in a support, so do these tendons press into the bone and leave their mark. Furthermore, being in close contact as they must, these muscles provide a direct effect on the calcaneus in supporting it while standing. Added lateral support is further gained from the presence of the tibialis posterior and its fibrous extension as it crosses above the sustentaculum tali.

The importance of these three tendons is further illustrated by a consideration of the bony relationship of the talus on the calcaneus. While the talus has a broad, flat base to rest on in the sustentaculum tali of the calcaneus, it must be noted that this structure is *not* centered over the body of the calcaneus. Rather, the weight of the body is transferred slightly off-center, creating a tendency for the calcaneus to roll medially into the familiar pronated position. This tendency is definitely overcome by the pressure of the great flexor tendons as they press into the medial calcaneus. (Figure 2)

Navicular and Cuboid

In these two bones the functional compromise of motion and stability is most readily indicated by the articular facets. Together these two articulate with five separate bones and permit motion at all five articulations. The fact that such movement is potentially free shows in the smooth surfaces they present, free of projections or fossae. It is the arrangement of the *position* of the articular surfaces, however, which indicates the presence of stabilizing factors. As stated by Grant, no two articular surfaces ever occur in the same plane. Hence, simultaneous motion in *any*

Figure 3. Variation of angulation of articulating surfaces of distil tarsal bones.

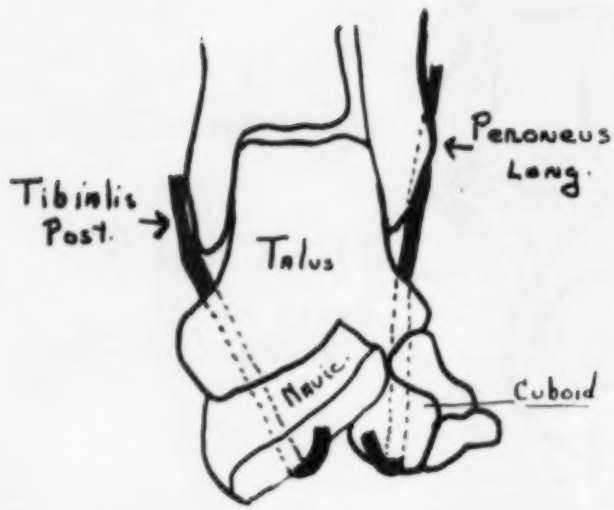

Figure 4. "Sling" effect of tibialis posterior and peroneus longus.

Figure 5. Indicating key position of second cuneiform.

one direction by all of these articulations is prevented. (Figure 3)

The inferior surfaces provide two bony markings of some significance to the function of total foot support. On both the navicular and the cuboid will be noted a deep groove indicating the passage of a strong and resilient tendon. Through these structures pass the great tendons of the peroneus longus and tibialis posterior and provide a close, sling-like support for the posterior and central foot. (Figure 4)

Cuneiform Bones

The functional excellence shown by the shape and positioning of the three cuneiform bones and their articulating metatarsals would delight a builder of bridges. The most obvious result reflected here is that of weight-bearing. With the distribution of force from the body above and the ground below centered around the second cuneiform, it presents a true "keystone" shape. Its sloping sides thus absorb force from all directions and lock the three cuneiform bones into a solid unit.

This tendency to compression around this joint is further increased by the interlocking of the tarsometatarsal joints. The second metatarsal, which is the longest of the five, projects backward to meet the second cuneiform. Since the first cuneiform is considerably longer, this forms a deep pocket for the second cuneiform and increases its "keystone" action. (Figure 5)

Metatarsals

The five metatarsals, while similar both in structure and function, have individual characteristics which set each apart. These differences are important in that they indicate the elements of function. The very massiveness of the first is indicative of its weight transmitting ability which is its most important job. The second, third, and fourth, however, present such contrast in size that it is immediately apparent that a greatly reduced force acts upon them. The fifth metatarsal again shows the result of weight by being noticeably larger than its neighbor, particularly at the proximal end. The presence of a tuberosity for the peroneus brevis muscle is also evidence of heavy muscle pull on this bone.

Phalanges

The bones which make up the toes all demonstrate the presence of varied muscles and particularly the direction of pull. It will be noted that all the projections tend proximally, creating an overhanging structure at the base of each phalanx. The distal phalanges of all the toes also present a flattened platform-like under surface

and is most marked in the great toe. It is easy to understand from this the propulsive function of these units in walking.

SUMMARY

An attempt has been made to point out how function relates to structure in the human foot. The obvious bony markings and basic factors of shape have been reviewed along with those functional factors that may have been responsible. It should be further emphasized that this concept is not limited to one area but can be applied to the entire skeletal system. A grasp of this concept will be found useful to a better understanding of body function, particularly of the neuromuscular and skeletal system.

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Suggestions from the Field

Four-Section Parallel Bars

Richard M. Lash, B.S., and Pearl B. Shulver

The House of St. Giles the Cripple in Garden City, New York, is an inpatient unit for cerebral palsy children between the ages of 2 and 14. The program in physical therapy is geared for intensive treatment with some form of ambulation as the ultimate aim for a large percentage of the cases. The inadequacy of our two sets of parallel bars, one large and one small, had been felt for some time. In designing a new set we had many factors to consider in order to meet the needs of all our children.

Due to the difference in the children's ages, the bars had to accommodate boys and girls of all sizes. Treatment space in the physical therapy department is at a premium, but a longer walking area was necessary not only for one but for several children at a time. Since our department is also used for demonstrations, medical conferences, and holiday programs with parties, it was necessary that the bars could be moved and stored without sacrificing stability.

It was decided to incorporate facilities for all children into one set of bars. This need was first met by making the bars adjustable in height. A second, lower bar, adjustable in both height and width, was also included so that the smaller children could use the bars at the same time. To assist the toddlers who walk outside the bars with minimal support, the lower bar forms a rectangle and serves as a low hand rail outside the bars. (See figure 1.) This bar has been very useful in teaching a child to walk with saw-horses. After having learned to walk inside the bars, a child may learn to use one saw-horse or cane, and still have the security of one bar before progressing on to two saw-horses. Piping of 1 inch diameter was used for all the railings so that tiny hands, incapable of grasping a larger pipe would be able to take a firm grasp. By using a pipe of smaller diameter we aided some of the older children who are too severely involved to grasp the larger pipe securely.

In constructing the base of the bars we successfully met the remaining qualifications which we had specified. We had decided that approximately 30 feet of walking area would be the optimum length for our bars. Since it is not always desirable to have this much space occupied, we designed the bars in four sections. Each section is 10 feet on the outside and is cut on a bias of 45 degrees. By planning a base of four sections, we had not only solved the problem of moving and storing, but we had also added to the versatility of our bars in that we could string them out in line formation and match them together in a square or in an "L" shape. Stability was insured by constructing the base of 1½ inch maple planking and locking the sections together

Richard M. Lash, Staff Therapist; Pearl B. Shulver, Coordinator of Therapies, The House of St. Giles the Cripple, Garden City, New York.

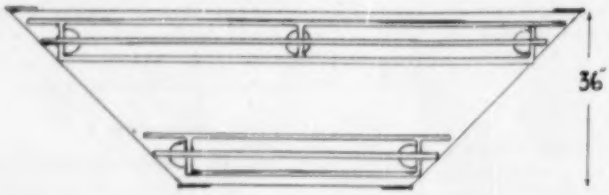
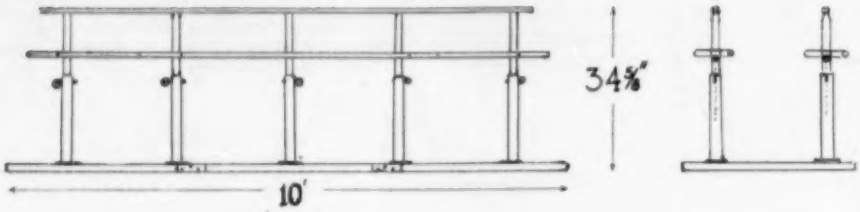



Figure 1. Typical section of parallel bars.



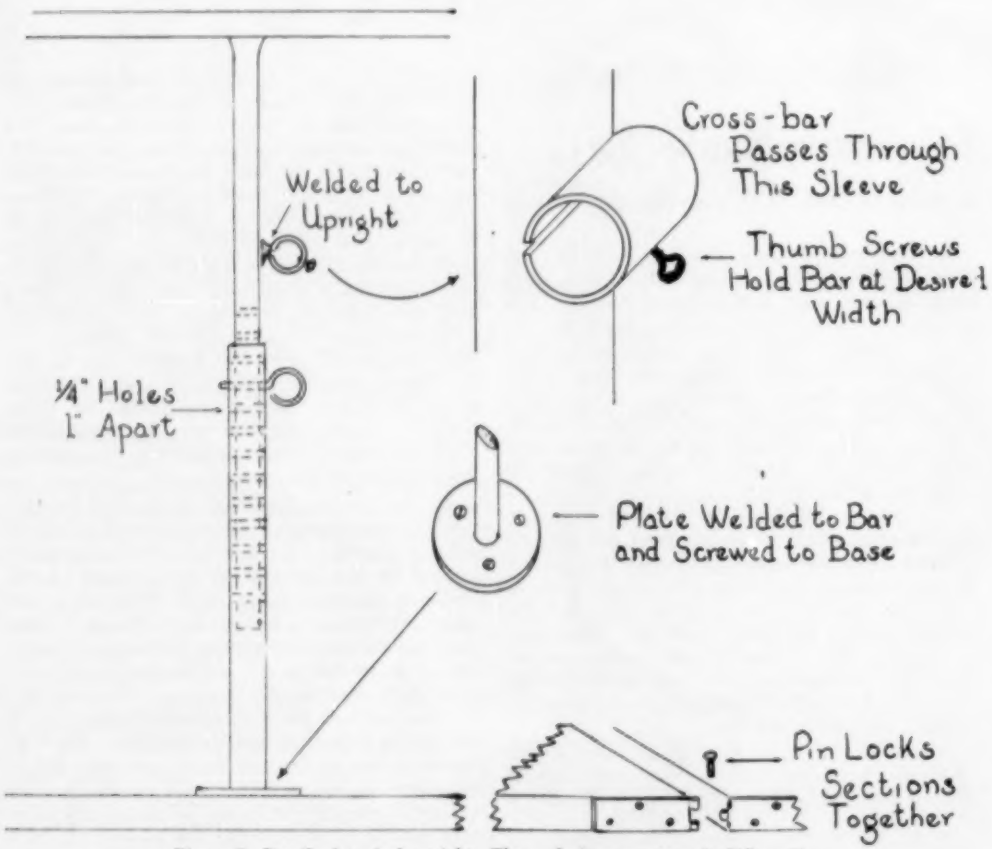

Welded to Upright
Cross-bar Passes Through This Sleeve
Thumb Screws Hold Bar at Desired Width
¼" Holes 1" Apart
Plate Welded to Bar and Screwed to Base
Pin Locks Sections Together

Figure 2. Detail of typical upright. The scale is approximately ⅜" = 1'.

with hinge plates and pins. All joints on the bars were welded and floor flanges screwed into the base to secure the bars. (See figure 2.)

CONCLUSION

After having been in use for one year, we find that these bars have met all the qualifications: they permit greater walking distance; they can be moved and stored; all age groups are able to use them; and one-hand walking may be practiced on the outside of the bars. They have been taken apart many times and moved. The position which we have found most practical for our space has been the "L" shape. (See figure 3.)

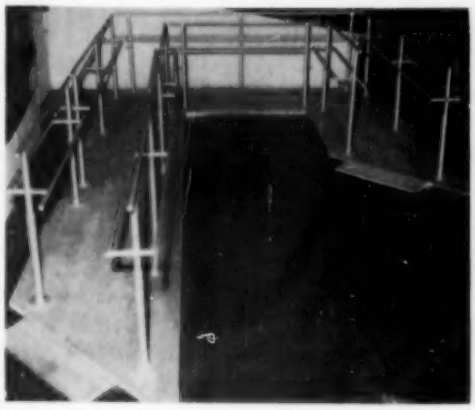


Figure 3. Bars in "L" shape.

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(continued on page 753)

Editorial

There surely can be no one in this country of ours who has not been made aware, during the past years, of the attempt to organize a workable Civil Defense program. We are constantly reminded in the press, magazines, radio, television, and on many kinds of public transportation that the authorities are working diligently to make each of us aware of his responsibilities. It is also true that no one denies the soundness of the established policies, or underestimates the need for an organized civilian population in the event of national disaster.

It is truly unfortunate that far too many of us have interpreted the meaning of "national disaster" as applying principally to action by a belligerent foreign power and, ostrich-like, have hopefully contended that the disaster might never come or that, should it occur, we would do something about it then.

During the month of August 1955 and again in October a large segment of our population in the heavily settled eastern part of this country learned suddenly and tragically that a national disaster can mean something much more familiar, much more probable, and even more destructive than an atom bomb. In terms of death, injury, loss of property, and civil destruction, the simple element of water spilled by Hurricane Diane and the so-called extra-tropical cyclone suddenly became a very real example of a disaster for which trained and organized Civil Defense workers were desperately needed.

The realization that purely natural forces which surround us at all times can create such havoc requires a reevaluation of our personal responsibilities and, much more important, a really critical and honest appraisal of our professional responsibilities to every Civil Defense program.

Do we, as physical therapists, have a particular responsibility and are we, because of our special training, particularly equipped to meet certain demands in special emergencies? What is our job on the Civil Defense team?

It is obvious that the greater part of our skills have no particular application to the demands of real emergencies. Certainly we will be needed badly in the weeks and months following a situation resulting in widespread injury since such injuries doubtlessly will be the same

Editorial

types we see every day. Yet, at the time of the actual disaster there are services which we can render which will contribute to the eventual outcome.

Foremost among the services for which we are trained and by means of which we can contribute are the many technics of ambulation. One serious problem in these emergencies is overcrowding of hospital facilities. If certain patients not seriously injured can be quickly and correctly taught crutch walking, wheel chair technic and simple ambulation it can help to empty much needed bed space.

Certain items of our equipment are such that they can be used for a variety of useful services. As a case in point the following item appeared in the October 1955 issue of *Hospitals* in an article concerned with the August flood in Waterbury, Connecticut, called "Hospitals In The Flood Crisis."

"At St. Mary's Hospital across the river, a quick thinking physical therapist filled the hospital's Hubbard tank and Whirlpool with tap water as soon as she realized there was a flood. While this water was not used for drinking, it proved invaluable for other purposes."

Apart from such direct service there are also contributions which can be made as a result of the nature of physical therapy training. The idea of team work, the recognition of the importance of details and accuracy of reporting facts, the ability to handle patients, the capacity to react to emergencies quickly and efficiently and the simple fact of being familiar with hospital routine can all be utilized.

We have a deep and present responsibility first as citizens and second as professional people to recognize our potential value and to volunteer our services in whatever capacity they are needed. Further, we have an equally important duty to serve in whatever capacity we may be needed. The actions of the physical therapist in Waterbury are commendable and point up vividly how some small, isolated act of common sense can contribute to a vital community need.

Marriages

Barbara A. Atwood, of Baltimore, Md. to Charles R. Ashford, Arlington, Va.

Shirley L. Hakes, of Cropseyville, N. Y. to Thomas A. Wheeler, Chicopee, Mass.

Clara M. Kelly, of Reading, Pa. to John H. Moodhard, Reading.

M. Denne Kuntz, of San Francisco, Calif. now Mrs. M. Denne K. Dempsey, Portland, Ore.

Adele Newman, of Braintree, Mass. to Richard Barcelo, Wollaston, Mass.

Vivian E. Nevue, of Chicago, Ill. to Robert C. Drye, Chicago.

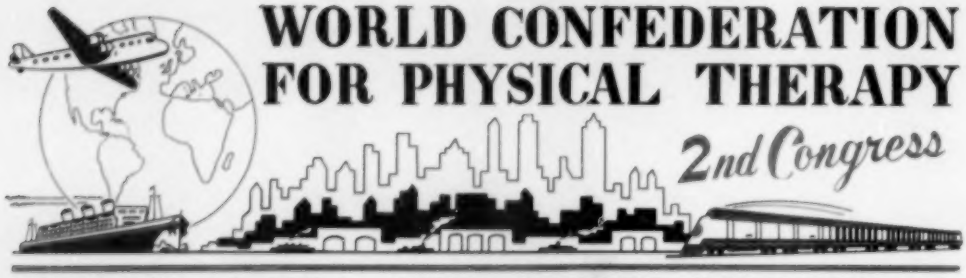
Mary Vaden, of St. Louis, Mo. to Elmore Day Jr., Cranberry, N. J.

Contributions

Recent contributions to the Second Congress Fund:

American Registry of Physical Therapists	$2,500.00
Eastern District, Pennsylvania Physical Therapy Assn.	200.00
Fauble, Capt. Phyllis	5.00
Northwestern University Alumni	75.00
Rockwood, Charles P.	10.00
Southern New Jersey District	10.00
Stano, Henry	5.00

Total contributions from chapters and districts, and individual members — $2,105.96.



WORLD CONFEDERATION FOR PHYSICAL THERAPY

2nd Congress

JUNE 17—23, 1956 · HOTEL STATLER · NEW YORK, N.Y.

Intermediate Program

Sunday, June 17

11:00 a.m.	Religious Services
2:00 - 5:00 p.m.	Registration
5:00 - 8:00 p.m.	Reception

Monday, June 18

Morning

Registration
Opening Ceremony

Afternoon

Summaries on status and needs in physical therapy by principal observers from governments
Coordinator: Morris Fishbein, M.D.

Evening

Boat trip around the Island of Manhattan.
Host: New York Chapter

Tuesday, June 19

Morning

"Health, A Strong Force for World Understanding—The Role of the Physical Therapist"
Howard Rusk, M.D.
"The Physical Therapist — His Education and Responsibilities"
Catherine Worthingham, Ph.D.
"The Physical Therapist — His Relationships to his Fellow Workers and the Community"
Colonel Harriet S. Lee

Afternoon

Two Concurrent Sessions

Session A

Panel Discussion — The Role of the Physical Therapist in the Evaluation Studies of Polio Vaccine Field Trials
Cerebral Palsy: Similarities and Differences in Methods of Treatment

Session B

Panel Discussion — Prosthetics — Research and Developmental Aspects and Training

Wednesday, June 20

Morning

Two Concurrent Sessions

Session A

—Principles of Underwater Exercise
—Therapeutic Use of Water
—The Physical Therapist on the Obstetrical Team (Great Britain)

Session B

—Symposium on Body Alignment as Related to Activity
—Posture and the School Child (Denmark)
—Posture in Industry (Sweden)
—Posture and Pain (England)
—Exercises for Bechterew's Disease (Germany)

Afternoon

Two Concurrent Sessions

Session A

—Symposium — Selected Testing and Evaluation Procedures
—Development and Current Use of Manual Muscle Testing in the United States
—Development and Current Use of Functional Testing in the United States
—Electromyographic Studies
—Joint Measurement — Technics and Recording Methods

Wednesday, June 20

Afternoon

Session B
—Physical and Physiological Effects of Introducing Heat to Living Tissues
—Physiological Basis for Heat

Evening — Banquet

Thursday, June 21

Morning — The Patient and the Physical Therapist in the Community's Rehabilitation Program — Symposium
The Patient as a Person
Canadian Home Care Program
Convalescent Program for the Severely Disabled
Utilization of Community Resources for Rehabilitation

Afternoon — General Meeting of the W.C.P.T.

Friday, June 22

Morning — Three Concurrent Sessions

Session A
—Symposium — Bracing and Adaptive Devices for Neuromuscular Disorders

Session B
—Educational Seminar

Session C
Papers from member societies of the W.C.P.T.

Afternoon — Panel Discussion — Responsibilities of the W.C.P.T.
Closing Ceremony

Film Theatre

Beginning Tuesday, June 19, there will be a daily schedule of films from abroad and this country.

Study Visits

Study visits will be scheduled to selected centers in New York City on two or more afternoons.

Social Events

The calendar of social events is not yet complete. In addition to planned receptions there will be New York with its Broadway, Times Square, Television and Radio Studios, Sightseeing, Theaters and Museums.

Post Congress Tours

Two 5-day tours—one to Boston, the other to Washington—will be available the week following the Congress. These are "all-expense" tours and include transportation service, meals, lodging, and tours. Both leave New York, Sunday morning, June 24th, and return to New York, Thursday evening, June 28th.

NUMBER 1—BOSTON $83.00

Sunday - June 24th

Leave New York and via George Washington Bridge, proceed to West Point (lunch at Thayer Hotel). Tour will continue to Great Barrington, Massachusetts, with a stop enroute at Hyde Park to visit the Roosevelt Memorial and Library. Overnight at Great Barrington.

Monday - June 25

Leave Great Barrington and proceed to Boston. Enroute a visit will be made at Sturbridge, Massachusetts where recreated is a New England farming community of a century and a half ago (lunch in the historic Tavern).

Tuesday - June 26

In the morning a sightseeing tour of modern and historic Boston will be accomplished by the Boston Gray Line. After lunch a visit will be made to Lexington and Concord.

Wednesday - June 27

The morning and early part of the afternoon will be utilized for professional visits. Group will be checked out and have their baggage on board in order that the departure from Boston can be coordinated with the professional visits. Taking the coastal route, the tour will pass through Plymouth, New Bedford, and Newport, Rhode Island. Overnight in Newport.

Thursday - June 28

The final day of the tour will continue along the coast line to Mystic, Connecticut where we will visit some of the remnants of this old seafaring town. The last leg of the trip will include a stop at New Haven for a professional visit. Arrival in New York will be about 8:00 P.M.

Courtesy of American Airlines

New York at Twilight

NUMBER 2—WASHINGTON $83.00

Sunday - June 24

Leave New York for Philadelphia, where a tour conducted by Philadelphia Gray Line will be accomplished.

Monday - June 25

The morning will be spent on a professional visit. In the afternoon, depart Philadelphia for Washington.

Tuesday - June 26

In the morning Washington Gray Line will conduct the group on a tour around the city terminating at the Capitol. After a guided tour through the Capitol, the group will have lunch in the hotel. The afternoon will be spent visiting Alexandria, Arlington Cemetery, and Mt. Vernon.

Wednesday - June 27

Professional visits.

Thursday - June 28

Leave Washington and return to New York via Annapolis. Lunch in Annapolis.

Reservations will be accepted now. Please indicate *Tour 1—Boston* or *Tour 2—Washington*. A $25.00 deposit is required and the full amount must be paid by May 15, 1956. The deposit, less 20 per cent, will be refunded if cancellation is received prior to May 1, 1956. The buses are the last word in comfort. They are airconditioned, have reclining seats and an underneath luggage compartment.

Post Conference Courses

University of Connecticut

The School of Physical Therapy at the University of Connecticut announces a course pertaining to Upper Extremity Bio-Mechanics to be presented at the Continuing Education Center the week of June 25, 1956, immediately following the Second Congress of the World Confederation for Physical Therapy to be held in New York City.

The course will include upper extremity prosthetics and problems of upper and lower motor neuron lesions. Charles Bechtol, M.D., Professor of Orthopedics at Yale University and Chief of the Orthopedic Department at Grace-New Haven Hospital, assisted by a physical therapist, an occupational therapist, and a prosthetist will give consideration to: (1) the procedures used in fabricating and fitting the latest types of functional artificial arms; (2) the principles of artificial arm operation; (3) the methods used in checking and evaluating their functions; (4) the technics most effective in teaching amputees to use these new type arms; (5) the therapy procedures necessary to prepare the stump for its role; and (6) the implications of these new type arms to the problems of rehabilitating upper extremity amputees.

Signe Brunnstrom, Consultant in Amputee Training, Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, New York City, will correlate a study

of the problems of upper and lower motor neuron lesions particularly relating to (1) the upper extremity and its relation to the tonic neck reflexes and the labyrinthian impulses; (2) peripheral nerve injuries, especially those in the shoulder girdle; and (3) the training program for the hemiplegic patient.

Expenses for the course will include a fee of $80.00, which completely covers tuition, board, room, and printed material. Ten dollars, which are not refundable, must be sent with the application.

Enrollment will be limited to 185. Details regarding the course outline, faculty, and travel arrangements will be sent at a later date to those who are accepted for enrollment. Application forms will be found in the January, 1956 issue of the *Physical Therapy Review*.

The Kessler Institute for Rehabilitation—June 25-27, 1956

The Kessler Institute announces a three-day post-conference program to discuss rehabilitation procedures as applied particularly to amputees, paraplegics, and quadriplegics. The program will be presented by institute staff and consultants and is open to conferees of the Second Congress, World Confederation for Physical Therapy.

Program outline:

Monday, June 25

Philosophy of the Rehabilitation Program.
Clinical Application with Demonstration.
Orientation to Physical Therapy Program.

Tuesday, June 26

Paraplegic program—training and bracing.

Wednesday, June 27

Amputee program—pre-prosthetic and prosthetic training for upper and lower extremity amputees.

The fee is $10.00. Registration is limited to twenty-five.

Letters of application to be sent to:

Ruth Dickinson, Director
Physical Therapy Department
Kessler Institute for Rehabilitation
West Orange, New Jersey, U.S.A.

University of Pennsylvania—June 25-29, 1956 Rehabilitation Principles and Practices

Notice of the course and application blanks have been sent by the University to all members of the American Physical Therapy Association. This course is made possible under a grant from the Office of Vocational Rehabilitation and no tuition is charged. A limited number of colleagues from other countries may attend provided that application is made in advance.

Boston University Sargent College

The Boston University Sargent College, Department of Physical Therapy announces an Introductory Course in Neuromuscular Facilitation Techniques to be given under the direction of Margaret Knott, Head Physical Therapist, California Rehabilitation Center, from June 25, to July 6, 1956.

The course will include instruction in the theory and practice of technics, and an analysis of muscle function in patterns of facilitation. Opportunity will be given for practice under supervision and observation of treatment procedures. The course may be taken for two semester hours credit at a cost of $40.00, or it may be taken without academic credit at a cost of $30.00. Room and breakfast will be provided in the college dormitory for $26.00.

The closing registration date will be June 1, 1956. Registration will be limited to 20 qualified physical therapists who are members of the American Physical Therapy Association, or of member associations of the World Confederation for Physical Therapy. Students will be selected as applications are received, but the right to select students on a geographical basis is reserved. Students should wear slacks. Each registrant will be sent mimeographed material for study before the course begins.

Those interested should apply to Professor Adelaide L. McGarrett, Physical Therapy Director, Boston University Sargent College, 6 Everett Street, Cambridge 38, Massachusetts. Please indicate whether or not academic credit is desired, and whether room and breakfast are desired.

New Endorsing Organizations

American Neurological Association
American Public Health Association
International Council of Nurses
National Rehabilitation Association
World Veterans Federation

Enroll Now

Send in your enrollment form prior to February 1, 1956. Early enrollment will help your planning committee. An enrollment form will be found on page 692 of this issue. For additional information write the National Office.

HOWARD A. RUSK, M.D., (University of Pennsylvania, 1925) is Professor and Chairman, Department of Physical Medicine and Rehabilitation, New York University College of Medicine; and Director, The Institute of Physical Medicine and Rehabilitation, New York University—Bellevue Medical Center. Other appointments include Associate Editor, New York Times; and Chairman, Health Resources Advisory Committee, Office of Defense Mobilization. "Health, a Strong Force for World Understanding—The Role of the Physical Therapist" will be Dr. Rusk's subject at the Congress.

During World War II, Dr. Rusk originated and directed the Convalescent-Rehabilitation Training Program of the Army Air Forces. He has been the recipient of the Distinguished Service Medal; an American Design Award; Survey Award; Meritorious Service Award, National Rehabilitation Association; Lasker Award, American Public Health Association; and the Dr. C. C. Criss Award.

On behalf of the United Nations, World Veterans Federation, International Society for the Welfare of Cripples, and the American-Korean Foundation, Dr. Rusk has observed and studied rehabilitation services in many foreign countries.

CHARLES O. BECHTOL, M.D., (Stanford University, 1940) is Associate Professor of Surgery and Chief of the Division of Orthopedic Surgery at Yale University. Dr. Bechtol is consultant in orthopedic surgery to the West Haven Veterans Administration Hospital and Chairman of the Technical Committee on Prosthetics, Committee on Artificial Limbs, National Research Council. He is a Diplomate of the Board of Orthopaedic Surgery and a member of the American Academy of Orthopaedic Surgeons.

Dr. Bechtol was formerly Assistant Clinical Professor of Orthopedic Surgery, University of California, San Francisco. He also taught at the University of California, Los Angeles. From 1950-1952 Dr. Bechtol served as a member of the Advisory Council of the American Physical Therapy Association. Dr. Bechtol will be a member of the panel on "Prosthetics" and will present "Research and Developmental Aspe ts."

THOMAS FRANCIS, JR., M.D., (Yale Medical School, 1925) is Chairman of the Department of Epidemiology, School of Public Health, University of Michigan. Dr. Francis will discuss "The Role of the Physical Therapist in the Evaluation Studies of the Poliomyelitis Vaccine Trials." He has served as Instructor in Medicine at Yale; Director of Influenza Research, Rockefeller Foundation; Director of Commission on Influenza, Army Epidemiological Board including missions to foreign countries; and as Professor of Bacteriology, New York University College of Medicine. During the past twenty years Dr. Francis has contributed to research on influenza, poliomyelitis, hepatitis, and pneumonia.

Dr. Francis is the recipient of awards from the National Academy of Science, American Public Health Association, American College of Physicians, and the Army of the United States. Advisory Committee or consultant appointments have included the Life Insurance Medical Research Fund, National Tuberculosis Association, and the United States Public Health Service.

"A niche of usefulness and self-respect exists for every man however handicapped: but that niche must be found for him. To carry the process of restoration to a point short of this is to leave the cathedral without a spire. To restore him and with him the future of our countries, that is the sacred work."

JOHN GALSWORTHY

With every good wish for the holidays

Association Activities

Summary of the Minutes of the House of Delegates American Physical Therapy Association Thirty-Second Annual Conference

The House of Delegates of the American Physical Therapy Association held its annual meeting at St. Louis, for two half-days, June 21 and 22, 1955. The Speaker, E. Jane Carlin, presided with Lucille Daniels as Vice-Speaker and Dorothy A. Graves as Secretary.

After roll call the first order of business was appointment of the following committee to edit the minutes; Brunetta Gillet, Washington, D. C., Doris Hall, Cincinnati, Ohio, and Dorothy A. Graves, Los Angeles, California.

On motion of Beatrice Schulz, the House of Delegates accepted the St. Louis Conference program as the report of the Program Committee.

Annual reports were given by the Secretary, Dorothy A. Graves; Treasurer, Dorothy Hoag; Chairman of the Judicial Committee, Clara Arrington; Chairman of the Nominations Committee, Florence Linduff; and Editor-in-Chief of the *Physical Therapy Review*, E. Jane Carlin. These reports with the exception of the Treasurer's appeared in the September, 1955 issue of the *Physical Therapy Review*. The auditor's report was distributed to every member in the May, 1955 Membership Newsletter.

Items of new business introduced were two resolutions: the first concerning a recommendation from the Board of Directors to the House of Delegates that a new section composed of self-employed physical therapists be established. The motion was passed unanimously by the delegates. The second resolution related to the establishment of Rules for Chapter Conduct, copies of which were given to all delegates. The Speaker of the House read the resolution and after considerable discussion and a roll call it was voted on by the House to consider the document point by point. As each point was raised for discussion there was much interchange of ideas between delegates with explanations solicited from Mary E. Haskell, Associate Executive Director. The Resolution was finally adopted by the House as follows:

Resolved, That the following shall be requirements for the conduct of affairs of every component chapter and/or district unless reasons for noncompliance in writing are acceptable to the Board of Directors:

1. Strict adherence to chapter and/or district bylaws;
2. Consideration of and action within specified time on communications from the Association;
3. Consideration of and action on business conducted by the governing bodies of the chapters and/or districts;
4. Filing of annual chapter reports to the Association within time specified by the Board of Directors;
5. Representation at meetings of the House of Delegates no less than once every three years;
6. Chapters with districts shall hold at least one annual chapter meeting and one chapter Executive Committee meeting and their component districts shall hold at least three district meetings and and three district Executive Committee meetings a year.
   Chapters without districts shall hold at least three chapter meetings and three chapter Executive Committee meetings a year;
7. Filling vacancies in chapter and/or district offices and standing committees within two months;
8. Amendment of existing chapter and/or district bylaws where necessary to implement this resolution.

The first session of the House of Delegates was then recessed to reconvene the following afternoon.

. . . . . .

The last session of the House of Delegates was opened by the Speaker of the House who turned the meeting over to Mildred Elson, Executive Director, and the national consultants. Their annual reports were presented as group commentaries. Individual reports appeared in the September *Review*.

The next item of business was the presentation

of a Resolution by Dorothy Frederickson which had been recommended by the Board of Directors as follows:

WHEREAS, The Children's Bureau, Department of Health, Education and Welfare, has performed an outstanding service to the children of the United States since its inception in 1935; and,

WHEREAS, It is continuing to develop its program for even greater service; and,

WHEREAS, At the present time it is placed administratively under the Social Security Administration and it has been recommended by the Medical Services Task Force of the Hoover Commission that it be placed in an administrative position in the Department of Health, Education and Welfare;

Be It Resolved, That the Executive Director of the American Physical Therapy Association be authorized to write to the Secretary of the Department of Health, Education and Welfare on behalf of the Association and giving recognition to the great service being rendered, and its importance to all children, and that its position under the Social Security Administration is not in keeping with the stature of the Bureau, and that consideration be given to carrying out the Medical Services Task Force recommendation that the Bureau be placed in an administrative position in the Department.

The Resolution after some discussion was passed unanimously.

A second Resolution was presented for the Board of Directors by Sarah Rogers:

WHEREAS, The American Physical Therapy Association is a membership organization whose object it is to foster the development and improvement of physical therapy service to the individual that the physical therapy needs of the people will be met; and,

WHEREAS, The American Physical Therapy Association because it influences legislation, its tax exempt classification does not permit the seeking of funds from donors who wish their gift to be tax free;

Be It Resolved, That the Board of Directors be authorized to secure information and to develop a foundation or trust for receiving tax-free funds for desirable charitable scientific, literary, or educational projects in line with the aims and purposes of the American Physical Therapy Association.

This Resolution was also adopted by the House of Delegates unanimously.

After a recess, the results of the judging of the Chapter Exhibits were given. Third place was awarded Southern California for its exhibit on "Rehabilitation in the Severely Involved Poliomyelitis Patient." Second place to Oklahoma for its exhibit "Try Volunteers in Physical Therapy." First place to Illinois for its exhibit on "Do's and Don'ts on Illustrative Material for Publication." Special mention was given to North Carolina for method of assembling their exhibit and to the Western Missouri Chapter for exhibit originality.

The first item of new business to be introduced was a request from Alfred Szumski of Virginia for permission to read a letter from Representative Bolton relative to the Bolton Bill. The letter was read and the request made that the delegates take this information back to their individual chapters.

A delegate from Pennsylvania presented the following proposal and moved its adoption:

WHEREAS, Bylaw III, Membership, Section 5—Good Standing (c) refers to the requirement for good standing in the component chapter for membership in the American Physical Therapy Association; and,

WHEREAS, Professional standards require compliance with existing state laws; and,

WHEREAS, The American Physical Therapy Association has promoted state legislation and it would seem consistent that all members should be expected to comply in those states with licensing or registration laws; and,

WHEREAS, The prestige of state chapters with state legislators, licensing boards and state organizations is being endangered by having chapter members practicing illegally in states requiring licensure; therefore,

Be It Resolved, That the House of Delegates go on record as recommending bylaw changes of the chapters within states requiring registration or licensure to make compliance with state laws mandatory for membership in good standing within the chapter.

Discussion followed and after a number of the delegates had spoken to this proposal it was moved that it be referred to a committee appointed by the Speaker. The motion carried. Recommendations of the committee are to be presented at the next meeting of the House of Delegates or by special bulletin to the delegates.

Mary Nesbitt, President of the American Physical Therapy Association, presented three new chapter charters, Alaska, Indiana, and Pennsylvania.

The final portion of the House of Delegates session was a progress report by Mildred Elson on the Second World Congress of the World Confederation for Physical Therapy to be held in New York, June, 1956.

The meeting was adjourned by the Speaker at the close of this presentation.

DOROTHY A. GRAVES
Secretary

Chapter News

Northern California

Northern California Chapter members enjoyed the opportunity of attending the 38th Annual Conference of the American Occupational Therapy Association held in San Francisco, October 24–28, 1955.

As part of its service the Chapter Placement Committee lists available positions in the Newsletter.

Michigan

Planning is underway for the 1957 Annual American Physical Therapy Association Conference in Detroit. Committee chairmen for the conference have been announced by the State Executive Committee.

The Western District expects to have a Refresher Course in April and requests suggested subjects from its members.

Greater New York District

District members held a barbecue one October Sunday which resulted in growth of the "Welcoming Fund." This money will be used to extend hospitality to foreign visitors to the World Confederation for Physical Therapy.

North Dakota

The North Dakota Chapter has aided recruitment in its state by supplying brochures, Physical Therapy as a Career, to the Vocational Guidance Service for North Dakota schools. All high schools in the state will receive the information.

Oregon

"New Faces," a section in the Oregon Chapter Newsletter, introduces new members. The name, school of graduation, and place of employment are included for each "new face" in the chapter.

Tennessee

The following is quoted from an editorial in the Tennessee Chapter Newsletter and reflects the sentiments of many loyal chapter officers and members throughout the country:

"In view of our growth and in view of the recent legislation requiring licensing for the practice of physical therapy in the State of Tennessee, the responsibilities of our organization are becoming greater. Recently we have elected our new chapter and district chairmen. Again, their leadership will be only as effective as the total of our individual contributions. Let us get behind them to continue meeting our responsibilities and continue in our growth."

CECIL PAINTER, *President*

Members Excel in Many Things

Helen Buchanan, charter member of the South Dakota Chapter, holds the honor of being Director of the Huron, South Dakota, Auxiliary Chorus which won the national championship in Miami in October at the American Legion Annual Convention. Miss Buchanan played a major role last year in obtaining the passage of the South Dakota Physical Therapists Practice Act.

Sarah Edlin of Louisville, Kentucky, was awarded two trophies in the culinary division at the 1955 Kentucky State Fair; one for cake baking and the other for canning. She gives credit to her husband who picks out the fruits and vegetables and helps "stir up" the cakes.

Journals Feature Association Members

Dorothy C. Billenstien, faculty member of the School of Physical Therapy at the University of Colorado is co-author of an article "The Reorganization of the Neurohypophyseal Stalk Following Hypophysectomy in the Rat" which appeared in the June 1955 issue of *Endocrinology*.

The article is the result of investigation supported in part by a research grant from the National Institute of Neurological Diseases and Blindness, Public Health Service, and part by the Office of Naval Research. Miss Billenstien is currently completing requirements for a Doctor of Philosophy Degree in Anatomy and was recently appointed by the American Physical Therapy Association Board of Directors to serve as a member of the Advisory Committee on Professional Education. She is also Vice President of the Colorado Chapter.

"Physical Therapy in Camps for Crippled Children" by Adelaide L. McGarrett, Ed. M., appeared in the April 1955 issue of *The Crippled Child*. Miss McGarrett is Physical Therapy Director of the School of Physical Therapy at Boston University, Sargent College. Recently she was awarded a travelship by the National Foundation for Infantile Paralysis and toured hospital and clinical facilities as well as physical therapy schools in twelve European countries.

Ted Corbitt of the Institute for the Crippled and Disabled in New York City and Joan Douglas of the Kessler Institute in West Orange, New Jersey were highlighted in an article appearing in the July 1955 edition of *Our World*. The

article "Life in Your Hands" described physical therapy, pictured treatment of patients with various disabilities and pointed up the continually growing need for more physical therapists.

An article, "The Rewarding Vocation of Physical Therapy" in the September 3, 1955 issue of *Presbyterian Life* featured the work of Marjorie T. Maguire at Childrens Hospital in Washington, D. C. and Suzanne P. Phillips of Beekman Downtown Hospital in New York City. In addition to stressing the personal satisfactions derived from working with patients, the story related some of the beneficial results of physical therapy treatment.

Ida May Hazenhyer

Ida May Hazenhyer passed away at St. Luke's Hospital in Chicago on October 24, 1955, following surgery and an illness of two months. She was a charter member of the Illinois Chapter, a member of the American Physical Therapy Association since 1924, and became a Life Member in 1954.

Miss Hazenhyer was a graduate of the Chicago Normal School of Physical Education and obtained her master of arts degree from Northwestern University in 1937. She served as a Reconstruction Aide at Fort Sheridan, Illinois, from 1919 to 1920. From 1920 to 1951 she was employed as a physical therapist by the Chicago Board of Education in the Department of Crippled Children at Jahn School. In 1951 the section was transferred to the new Burbank School where she served until her retirement in December 1952.

During her many years of membership in the Association, Miss Hazenhyer had a keen interest in her professional organization. She took an active part in her local chapter and was Secretary of the Association from 1926 to 1928. She had an interest in and a talent for writing and was requested to write "A History of the American Physiotherapy Association" which was published in the *Review*, volume 26, numbers 1, 2, 3 and 4 (1946). This was later reprinted and published in pamphlet form. She was well qualified for this assignment as she had taken part in the making of the history of the APTA during this period of growth and development. She classified the history as Pioneering Days, Formative Years, Coming of Age and Maturity. She served as Associate Editor to the *Review* from June 1932 to November, 1933, and as Editor-in-Chief from November 1933 to June 1936.

Miss Hazenhyer contributed an article on physical therapy as a profession in *Bios*, Journal of Honorary Biological Fraternity—Beta Beta Beta in 1947.

"Hez," as she was known to her friends, loved nature and the outdoors and spent much of her leisure time in travel. In recent years she amused herself by painting but was exceedingly modest regarding her accomplishments. She was self sufficient and independent. Her death was a great shock even to those who were near her. To those who have known her, she will be remembered for outstanding genuineness and sincerity.

GERTRUDE BEARD

Lydia M. Wright of Mount Pleasant, Iowa, passed away on October 1, 1955. Miss Wright was a graduate of Sargent School of Physical Education, class of 1926, and received her physical therapy training at Fitzsimons General Hospital in 1945. She served at Fort Knox, Kentucky, and after discharge from the Army Miss Wright volunteered to the Polio Recruitment Service and was assigned to Deaconess Hospital, Freeport, Illinois. Miss Wright had been a member of the Association since 1945 and was a member of the Iowa Chapter.

Word has just been received that Ann Kelley of Moline, Illinois, passed away in January of this year. She had been a member of the Association since 1928 and was a member of the Illinois Chapter at the time of her death.

Miss Kelley received her physical therapy training from Dr. Frank Granger in Boston. From 1924-1935 Miss Kelley was a supervisor in the physical therapy department of Mayo Clinic, Rochester, Minnesota. She was most recently employed at the Moline Public Hospital, Moline, Illinois.

Helen Louise Varelia, Ensign, United States Navy, passed away on November 3, 1955, at the U. S. Navy Hospital, San Diego, California. Ensign Verelia was a graduate of Fresno State College, Fresno, California, and received a certificate in physical therapy from the University of Southern California in 1952. She had been a member of the Association since 1953 and prior to transfer to the San Diego Chapter was a member of the Southern California Chapter.

Dorothy Voss Joins National Office Staff

In October Dorothy E. Voss, former Secretary and Chairman of the Public Relations Committee, accepted an appointment as Consultant in the Chapter and Membership Division of the Association. Miss Voss has just returned from a five months' assignment as physical therapy advisor in Cairo, Egypt, with the International Cooperation Administration of the U. S. Government.

In accepting this appointment Miss Voss resigned as an elected member of the Nominations Committee. Her past experience in Association and chapter organization provides an ideal background for contributing to the development of chapter services. In addition to the national offices she has held, she has served in the past as Chairman of the Relations Committee of the Massachusetts Chapter; Chairman of the Membership Committee; and President of the District of Columbia Chapter. She was a charter member of the Louisiana Chapter and has also been a member of the Northern California Chapter.

New Student Members

Albany Hospital

Letitia Allbee
Marcia Bentley
Nancy E. Blair
Beverly Bugel
Irma Roberta Gordon
Virginia Halbrook
Constance Keating
Jane M. Lieff
Sandra Matteson
Jeanne C. O'Brien
Suzanne Rogan
Trenna Wicks
Irma Wilhelm
Ann Wolcott

Columbia University

Yvonne Andrau
Jane Ast
Katharine Matthews
Leslyn Michels
Patricia Avis
Lee Cairns
Philomena Cardone
Cynthia Cheney
Ann Crowther
Gay Maria DeLong
Yvonne Duzansky
Gerald Charles Dunn
Ann Ewing
Francis J. Gallo
Marlene Ginsberg
Jane Gray
Lila Hoch
Joan Jacobs
Maria T. Jimenes
Nora P. Kan
Julia Little
Joseph Matera
Priscilla Mudge
Michael Paolino
Dorothy Peirce
Barbara Ranzman
Anna Richards
Frances Riley
Linda Rosenblum
Mary Kathleen Scully
Myrna Serotick
Ella Shapiro
Marilyn Slater
Alvin Solomon
Mary E. Timberlake
Peter E. Trainor
Lee Ullian
Joanne Walsh
Babette Wessner
Mattha Westenenk
Virginia Work

Hermann Hospital

Roy Culver
Walter Fairfield
Robert Hunter
Jack Lane
George F. Lawhorn
Veanna Lee
Muriel McGlamery
Nelda Montana
Leona Schifani
Edmond B. Story

Northwestern University

Margaret Chamberlain
Anthony Lynn
Lois Judd
Dolores Jonas
Nancy Brinker
Diane Benjamin
Phyllis Gray
Rodgess Whittington
Mary A. Tomasiewicz
Mary Shepeck
Edith Petty
Margaret E. Nagle
Ruth Lacey
Elizabeth J. Hentschel
Sister Mary Martin
Barbara Erkert
Audrey A. Dietrich
Patricia Dalrymple
Isabelle Bohman
Sister Rosemond Belongeay
Glenda Barnes
Sue Allman

University of California

Theo Adkins
Barbara Betka
Jean Biddison
Nancy Blackett
Nancy A. Cayard
Dora Cochrane
Nancy Crum
Gail Dixon
Jean Doolittle
Yvonne Edwards
Betty Fong
Theodore R. Forbes
Kay N. Helgesson
Janice L. Hunt
Hildred Jensen
Tetsumi Kimura
Mary Little
David A. Lopez
Nancy Lund
Bonnie L. Morrison
Selma Polonsky
Virginia C. Post
Janice Robbin
Idell Rosenthal
Sheila Steele
Elise Stone
Eleanor Tarlow

University of Kansas

Jessie Ball
Marjorie Bedell
Lucille Bremenkamp
Robert Boesiger
Robert E. Briggs
Elena De Santos
Carole Fisher
Kenneth Fox
Dorothy Green
George Medill
Jenanne Patterson
Otto Payton
Janis Pocock
Pearl Pleas
Catherine Quinn
Mary Lou Reyburn
Robert Shoemake
Wendell Smith
Johanna Trotter
Carol Wells
Chalma Neill Whitaker

University of Minnesota

Arlene Babb	Audrey Lofgren
Beverly Coulter	Margaret McCall
Mary P. Dahlquist	Marjorie Owens
Donald Dykinga	Steve Senich
Anne Hocking	Leslie D. Soder
Ruth Jensen	Janice Steadland

Jay I. Wexler

University of Pennsylvania

Ernest Burch Jr.	Mary Moranz
Shirley Forest	Jimmie Mister
Donald Frey	Margaret Parquette
Sabel Gozinsky	Catherine Peter
Carol Harmon	Martha Roberts
Leo Henry	Edward Rushin
Carol Kormendy	Lamont Smith
Clifford Liu	Sally Stull
Deborah Lukens	Leonard Tracer
Sayers Miller	Luz Pena

Grants Announced

The National Foundation for Infantile Paralysis has announced grants and appropriations totaling $1,372,513 for professional education in selected fields. Basil O'Connor, National Foundation president, declared that this allocation will materially help to train doctors and associate medical personnel urgently needed for research and total patient care. The shortage of doctors, nurses, medical social workers and occupational and physical therapists threatens the effective care of thousands of patients.

These new awards bring to a total of $21,562,456 the March of Dimes funds authorized since 1938 for the National Foundation's comprehensive program of professional education, the largest ever undertaken by a voluntary agency. In all, 5,334 scholarships and fellowships have been awarded by the National Foundation from 1938 through August 30, 1955.

Of the total sum of $1,372,513 newly authorized, $681,513 was granted to medical schools, universities, hospitals and professional associations throughout the United States, and $691,000 was appropriated for March of Dimes fellowships and scholarships.

The current appropriations for fellowships and scholarships provide for $560,000 for applicants who are preparing for research and other careers in medicine and the related biological and physical sciences, $31,000 for orthopedists interested in advanced study and $100,000 for students of medical social work.

Of the institutional grants, one to the University of Minnesota Medical School is especially noteworthy since, with the funds thus advanced, the Minneapolis institution becomes the thirteenth medical school in the country to participate in a unique National Foundation sponsored project in medical education. Participants in the project are engaged in long-range programs seeking to devise new approaches to undergraduate and graduate teaching of comprehensive care or total rehabilitation not only for polio patients but for all handicapped persons.

Grants include:

American Physical Therapy Association, New York City: $74,530 to support the Association's educational advisory and recruitment programs, under direction of Mildred Elson, executive director.

National Committee Meetings

The Board of Directors held a four day semi-annual meeting in New York, October 19-22. All members of the Board attended the meeting and were joined on October 21 by two members of the Advisory Council, Lt. Col. Raoul Psaki and Dr. Aura T. Severinghaus. A summary of the business transacted will be published in the next issue of the *Physical Therapy Review*.

The Joint Committee of the American Hospital Association and the American Physical Therapy Association met in New York on October 15.

The Advisory Committee on Professional Education met in Atlantic City, New Jersey, October 26-29.

The Nominations Committee will meet in New York, December 1-3 to select a slate of officers for the 1956 elections.

The Judicial Committee will meet in New York, January 5-7.

Postgraduate Cerebral Palsy Course Columbia University

Announcement has been received of the following postgraduate cerebral palsy courses offered to physicians, physical, occupational and speech therapists and nurses who are properly qualified and experienced in the field of rehabilitation.

Name of Course

Postgraduate Cerebral Palsy Courses

Sponsor of Course

Columbia University

Dates of Course

Physicians' Course — April 16–May 4, 1956

Physical Therapists', Occupational Therapists', and Nurses' Course — April 16–June 15, 1956

Course Content

Lecures, demonstrations, and seminars covering medical management, basic science review and psychosocial aspects, as well as clinical experience in all types of facilities.

Tuition

Physicians' Course — $100.00.
Physical Therapists', Occupational Therapists', Speech Therapists', and Nurses' Course — $210.00 (8 points credit)
A list of scholarship sources will be sent on request. For further information address:

Office of the Dean
Columbia University College of
Physicians and Surgeons
630 West 168 Street
New York 32, N. Y.

Short Term Course

Announcement has been received of a course open to physicians, nurses, medical social service workers, physical and occupational therapists and covering complete care of poliomyelitis with emphasis on the severely involved patient, the physician's responsibility in the effective coordination of auxiliary services, and the value of comprehensive care.

Name of Course

Demonstration of Clinical Management of Poliomyelitis

Sponsor of Course

Baylor University College of Medicine, Southwestern Poliomyelitis Respiratory Center and Jefferson Davis Hospital in cooperation with the National Foundation for Infantile Paralysis, Inc.

Dates of Course

February 27, 28, 29 and March 1 and 2, 1956

Course Content

Lecture discussions will include diagnostic methods, treatment of acutely ill patients, indications and use of respiratory equipment, physical and occupational therapy programing and functional goals of the rehabilitation program.
Case conference demonstrations covering total medical care and philosophy of treatment will be held. There will be demonstrations of various types of respiratory equipment with opportunity for supervised practice in their use and application. Small discussion groups will meet according to specialty area, i.e. medical care, physical therapy, occupational therapy, nursing and social work, to discuss technics and relationships to total program.

Fee

Tuition — $8.50 which will cover cost of syllabus, "Treatment of Acute Poliomyelitis"

Financial Assistance

Physicians and nurses requesting financial assistance may apply to their local chapter of the National Foundation for Infantile Paralysis, Inc. All medical social workers, physical and occupational therapists, and any physicians and nurses whose professional responsibilities cover more than the local area should direct inquiries to the Division of Professional Education, The National Foundation for Infantile Paralysis, Inc., 120 Broadway, New York 5, N. Y.

Note: Applicants for financial assistance must submit completed applications to the National Foundation office at least six weeks prior to date course begins.

Living Accommodations

Accommodations must be arranged by the individual

General Information

Preference will be given to personnel who are or will be directly concerned with poliomyelitis patient management. A selected number of nurses, physical and occupational therapists may arrange to stay two weeks or one month for additional theory and practice in the area of their specialization.

Additional information and application forms may be obtained from:

William A. Spencer, M.D., Medical Director
Southwestern Poliomyelitis Respiratory Center
Jefferson Davis Hospital, 1801 Buffalo Drive
Houston 3, Texas

Correction

In a news note in the October *Physical Therapy Review* regarding an article published by a member of the Association, it was stated that the author, Henry O. Kendall, was affiliated with the Delaware Chapter. This is not correct; Mr. and Mrs. Kendall are active members of the Maryland Chapter of the American Physical Therapy Association.

March of Dimes

Lucy Blair, Consultant, Professional Services in the National Office, discusses the role of the physical therapists in the 1954 Poliomyelitis Vaccine Trials with Mr. Basil O'Connor, President of the National Foundation for Infantile Paralysis and Dr. Jonas Salk who developed the Vaccine.

It will be recalled that the American Physical Therapy Association presented citations to Mr. O'Connor, Dr. Salk, Miss Blair and the seventy-six physical therapists who participated in the program throughout the country.

The people of the United States will be asked to give $47,600,000 to the March of Dimes next January to carry on the fight against polio.

The largest single sum in the National Foundation's financial forecast, more than 55 cents out of every dollar, is $26,500,000 for care and assistance to polio patients. It is estimated that at the end of 1955, before any 1956 cases are reported, there will be 68,000 patients receiving aid from National Foundation chapters. The total number of polio cases for 1955 is expected to be approximately 30,000.

"The fight on polio is far from over," Mr. O'Connor said. "Neither polio nor any other disease can be conquered by the announcement that an effective vaccine has been found. We have had tens of thousands of polio cases this year, and we know there will be many in 1956."

The $26,500,000 for patient care and financial aid, Mr. O'Connor said, is based on a national incidence for 1956 of 30,000 cases, or three-quarters of the average over the last five years.

The sum includes help to patients by the 3,100 chapters of the National Foundation and support for 14 regional respirator centers which have been established from coast to coast.

These centers have two major purposes. First, to teach patients with respiratory difficulties to overcome their dependence on iron lungs and lead more nearly normal lives, and second, to do research on patient care and teach what is learned to physicians and other professional workers.

"We have learned a remarkable thing," Mr. O'Connor said. "We have found that almost every polio patient in an iron lung can be taught to live without it all or part of each day. Our respirator centers ought to be called discovery centers because they are places where patients discover the potentialities they have despite their handicaps, and where doctors discover more about how to help these patients."

A need of $2,600,000 for scientific research is included in the financial forecast.

"Much research remains to be done," Mr. O'Connor said. "For example, we do not yet know how long immunity from the Salk vaccine lasts. It will take time to find this out and to establish a satisfactory schedule of booster innoculations, if they are needed.

"At present the virus for the vaccine is grown in cultures of monkey kidney tissue. This means that we are dependent on the costly import of monkeys from India for every cubic centimeter of vaccine that is manufactured. A number of our scientists are searching for a normal human or animal cell that can be cultivated indefinitely in the laboratory and can serve as a host for the mass production of virus, thus freeing us from the need for monkeys.

"In Dr. Salk's laboratory, and elsewhere, researchers are studying the vaccine itself. It is not 100 per cent effective as it stands. No vaccine is. We hope that research now in progress will raise its level of effectiveness.

"Some scientists believe that the ultimate in polio protection may come from a live-virus vaccine as opposed to the inactivated, or dead virus, used by Dr. Salk. Research in this area will continue. Investigators will also study the possibility of using the Salk vaccine in conjunction with a live virus vaccine, but they must find appropriate live viruses first."

Mr. O'Connor said that research into drugs for polio will continue. In the last year, he said, encouraging reports have been received on the use of drugs to prevent paralytic polio in animals. A successful preventive drug would be of value in a polio epidemic, where it might speedily be given to those who had not been vaccinated.

The National Foundation president emphasized the importance of disseminating information about the vaccine and other developments in the fight against polio to the medical profession and the public.

"Obviously," he said, "the vaccine will not fulfill its promise unless it is widely used. To this end, we consider it an obligation to bring scientific facts about it to those who must act on these facts." The estimated need for professional and public education is $2,600,000 and includes the National Foundation's programs of scholarships and fellowships.

Chapter and medical services will require $3,600,000. The need for public information services is $300,000, for administration of the 3,100 local chapters and national headquarters, $2,100,000 and for fund raising, $5,200,000.

Unpaid obligations of $4,700,000 for patient aid and polio prevention in 1955 are a part of the estimated need for 1956.

"The coming year," Mr. O'Connor said, "should bring us an exciting advance against polio. We now know that this insidious disease can be beaten. We are prepared to get on with the job."

National Art Contest for the Handicapped

A nation-wide art contest for the handicapped was announced recently by the following sponsors: The President's Committee on Employment of the Physically Handicapped; Office of Vocational Rehabilitation, Department of Health, Education and Welfare; Veterans Administration; and Morris Morgenstern Foundation. The purpose of the contest "is to further and encourage the careers of talented amateur artists who are handicapped; to dramatically illustrate the employment and rehabilitation potential of the handicapped and generally to increase public awareness of the contribution being made to our society by the handicapped."

To be considered eligible for the contest, the handicapped person must be one who does not earn the major portion of his income as an artist, and whose ability to function in normal day-to-day activities is substantially impaired by disease, congenital condition, or injury.

Entries must be original work done in oil, water color, gouache or tempora on canvas or paper. Entries must be no larger than fifty inches on any side and must be appropriately matted or framed. Glass frames are not permitted and heavy or bulky frames should be avoided. Only one entry per contestant is admissable.

Twenty-two prizes range from $1,000, first prize, to $50 U. S. Savings Bond. The contest begins November 6, 1955 and ends at midnight, May 1, 1956. Further information may be obtained by writing to the

National Art Contest for the Handicapped
c/o Morris Morgenstern Foundation
119 West 57th Street
New York, New York

Self-Help Devices For Rehabilitation

The seventh of a series of pamphlets on *Self-Help Devices for Rehabilitation* has been published by the New York University - Bellevue Medical Center, Institute of Physical Medicine and Rehabilitation. This latest report includes additional aids for dressing, grooming, and eating; several page turners, two of which can be used by the respirator patient; aids for climbing stairs; special chairs; parallel bars; and many other suggestions.

This series is a cooperative service project made possible by the National Foundation for Infantile Paralysis.

General News

Socio-Economic Aspects of Orthopedic Engineering

Challenging problems involved in the restoration of function to persons with paralysis or amputations will be discussed by leading authorities as part of the 122nd meeting of the American Association for the Advancement of Science in Atlanta, Georgia, during Christmas week, 1955.

At morning and afternoon sessions in the Atlanta Municipal Auditorium on Friday, December 30, new developments in orthopedic braces will be discussed from the medical and engineering viewpoints.

Of particular interest will be presentations of the little-known economic aspects of the brace and artificial limb industries. Other papers, in discussing social and economic productivity of patients requiring such appliances, will consider the many benefits for the individual and the financial profit as well as the humane values earned by society on investments in rehabilitation.

Dr. Robert L. Bennett, Medical Director of the Georgia Warm Springs Foundation, will open the meeting with a discussion of the advances made in the bracing of persons with severe arm paralysis. Numerous assistive devices used by such people in performing their daily activities will be demonstrated.

Grace Marie Freymann, Psychologist, Georgia Warm Springs Foundation, will analyze the results of a follow-up study of polio patients, dealing with the economic status attained, family assistance required, employer and family attitudes, and the need for repairs and changes in their devices.

Donald Dabelstein, Assistant Director, Office of Vocational Rehabilitation, Department of Health, Education and Welfare, will present data regarding the economic outcomes of vocational rehabilitation of the orthopedically disabled, summarizing experiences of various state divisions of vocational rehabilitation.

The afternoon session will begin with a discussion of the economic aspects of the artificial limb industry by McCarthy Hanger, Jr., President, J. E. Hanger, St. Louis, Mo., and currently President, Orthopedic Appliance and Limb Manufacturers Association. A similar discussion of the economics of the bracemaking and fitting industry will be offered by W. Frank Harmon, Atlanta Brace Shop, Atlanta, and First Vice-President, Orthopedic Appliance and Limb Manufacturers Association.

A paper on new developments in bracing will be presented by Dr. Augustus Thorndike, consultant to the Veterans Administration and Chief Surgeon, Department of Hygiene of Harvard University; Dr. Murphy, an engineer in charge of VA's research on prosthetic and sensory aids; and Anthony Staros, Chief of VA's Prosthetic Testing and Development Laboratory. Machine and clinical tests of new plastic bushings to reduce wear will be described as will a brace for low back injuries and application of new principles to braces for paralyzed arms.

It is planned to have an exhibit with the theme "Toward Better Bracing" during the entire week of the AAAS meetings. Research activities leading to improvements in design, fabrication, and fitting of braces will be highlighted.

Cerebral Palsy Research and Educational Foundation

In order to accelerate the research attack on the complex problem of cerebral palsy, a special Research and Educational Foundation has been established by United Cerebral Palsy and a group of interested industrialists.

At an organization meeting of the new foundation officers were elected and include:

Chairman of the Board—Leonard H. Goldenson, of New York, President of American Broadcasting-Paramount Theatres, and also Chairman of the Board of United Cerebral Palsy

President—Jack Hausman, of New York, President of M. Hausman & Sons, and also President of UCP

Mr. Hausman listed the following reasons for the formation of the Foundation:

1. It will make it possible for foundations and

corporations that are not in a position to contribute to on-going programs of service to help support the long-range research program.

2. It will make more funds available for cerebral palsy research and thus speed the day when more and more cases of cerebral palsy can be prevented.
3. It will make it possible for donors to designate gifts for specific research projects.
4. It will assure continuity to a research program that can succeed only if it is planned for many years ahead.
5. It will assure donors that every penny donated for research will actually be expended in grants-in-aid, inasmuch as United Cerebral Palsy will bear all administrative costs of the Foundation.

National Society Announces Appointment of Executive Director

Dean W. Roberts, M.D. of Baltimore, Md., nationally known medical administrator, physician and leader in the field of public health, has been appointed executive director of the National Society for Crippled Children and Adults, it was announced by Edgar Kobak, New York president.

Dr. Roberts, since 1952 director of the pioneering National Commission on Chronic Illness, will succeed Lawrence J. Linck, who has been executive director of the National Society since 1945. He will take over his duties as he is able to fulfill his responsibilities in completing the work of the Commission.

Mr. Kobak said: "In Dr. Roberts, the National Society has found a man of fine medical background combined with strong administrative ability to continue the expansion of our 34 years of service.

"The new executive has attracted international attention through his achievements in the field of public health as the executive head of the Commission and as Deputy Director of the Maryland State Department of Health in its trail-blazing program to solve state medical care problems without federal financial aid, and through his work on maternal and child health in Brazil for the World Health Organization."

Mr. Linck has been requested to continue to serve the Society in the voluntary role of trustee-at-large and as counselor, thus continuing an already distinguished career of service to the crippled.

As director of the Commission on Chronic Illness, Dr. Roberts has given national leadership to research on the community aspects of long term illness and disability.

Nieuwenhuize of the Netherlands Appointed to Staff of ISWC

The appointment of Hendrik Niewenhuize, M.A., of Amsterdam, The Netherlands, to the staff of the International Society for the Welfare of Cripples, was announced recently by Dr. Howard A. Rusk, President of the Society.

Prior to coming to New York to fill his new post, Mr. Niewenhuize served as Secretary General of the Netherlands National Federation for Mental Health. He also was President of the Netherlands Scientific Film and Documentation Center, Treasurer of the Netherlands Scientific Film Library, Secretary of the Film Section of the World Federation for Mental Health, as well as a member of the Netherlands National UNICEF Committee.

Cerebral Palsy Academy Elects Officers

At the meeting of the American Academy for Cerebral Palsy, Memphis, Tennessee, October 10, 11 and 12, the following officers were elected for the forthcoming year:

Dr. Margaret Jones, *President*
University of California Medical Center
Los Angeles, California

Dr. Nicholson J. Eastman, *President-Elect*
Johns Hopkins Hospital
Baltimore, Maryland

Dr. Robert A. Knight, *Secretary-Treasurer*
869 Madison Avenue
Memphis, Tennessee

The 1956 meeting will be held in Chicago; the 1957 meeting will be held in New Orleans.

Artist Designs APTA Christmas Card

The little angel of the *Physical Therapy Review's* Christmas greeting is the work of Mrs. Sheila R. Raymond, clerk-receptionist at the Department of Physical Therapy, Graduate Hospital of the University of Pennsylvania. She is married to Sidney Raymond, physical therapist on the staff of the University Hospital.

Editorial Assistants

Those who have abstracted articles for the December *Review* are Margot Trimble, Dominic Paglialunga, Betty Jean Smith, and Jean Cuthbertson. The Assistant Editors wish to thank these members for their help in bringing to our readers articles of interest from more than 300 journals.

Physical Therapy Programs—1956

APPROVED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Schools offering the four year program leading to a baccalaureate degree will accept high school graduates, *as well as transfer students.* Schools offering the 12 to 16 months program leading to a certificate will accept students who have completed all or most of their undergraduate work providing they meet certain course requirements. Recipients of a degree or certificate have equal professional recognition and status. For specific information regarding each school's entrance requirements, tuition, and other fees, please write to the director indicated below. All students should investigate course requirements *early.*

	Degree	*Certificate*
CALIFORNIA		
Mrs. Mary J. Dodge School of Physical Therapy Childrens Hospital Society 4614 Sunset Boulevard Los Angeles 27		†
Mr. R. William Berdan School of Physical Therapy College of Medical Evangelists 312 N. Boyle Avenue Los Angeles 33	†	†
Mrs. Margery L. Wagner Curriculum in Physical Therapy University of California The Medical Center San Francisco 22	†	†
Miss Charlotte W. Anderson Department of Physical Therapy University of Southern California University Park Los Angeles 7	†	†
Miss Lucille Daniels Division of Physical Therapy Stanford University Stanford	†	†
COLORADO		
Miss Dorothy Hoag Curriculum in Physical Therapy University of Colorado Medical School Denver 20	†	†
CONNECTICUT		
Miss Frances Tappan School of Physical Therapy U 101 University of Connecticut Storrs	†	
ILLINOIS		
Miss Elizabeth C. Wood Course in Physical Therapy Northwestern University Medical School 303 East Chicago Avenue Chicago 11	†	†
IOWA		
Mrs. Olive C. Farr School of Physical Therapy State University of Iowa University Hospitals Iowa City		†
KANSAS		
Mrs. Ruth G. Monteith Section of Physical Therapy University of Kansas Medical Center Kansas City 3	†	†
LOUISIANA		
Miss Sarah S. Rogers School of Physical Therapy Charity Hospital of Louisiana 1532 Tulane Avenue New Orleans 12		†
MASSACHUSETTS		
Miss Shirley M. Cogland *School of Physical Therapy Simmons College-Children's Hospital 300 Longwood Avenue Boston 15	†	†
Miss Adelaide L. McGarrett Curriculum in Physical Therapy Sargent College, Boston University 6 Everett Street Cambridge 38	†	†
Miss Constance K. Greene Curriculum in Physical Therapy *Bouve-Boston School, Tufts College Medford 55	†	
MICHIGAN		
Miss Virginia Wilson Curriculum in Physical Therapy University of Michigan University Hospital Ann Arbor	†	†
MINNESOTA		
Mrs. Ruby M. Overmann Course in Physical Therapy University of Minnesota 860 Mayo Memorial Hospital Minneapolis 14	†	
Mr. Darrell D. Hunt School of Physical Therapy Mayo Clinic Rochester		†

* Accepts women students only

	Degree	Certificate
MISSOURI		
Sr. M. Imelda, S.S.M. Course in Physical Therapy St. Louis University 1325 South Grand Boulevard St. Louis 4	†	
Miss Beatrice F. Schulz Department of Physical Therapy University of Washington, School of Medicine St. Louis 10	†	
NEW YORK		
Miss Dorothy L. McLaughlin *School of Physical Therapy Albany Hospital-Russell Sage College New Scotland Avenue Albany 1	†	†
Miss Mary E. Callahan Courses for Physical Therapists Columbia University College of Physicians & Surgeons 630 West 168th Street New York 32	†	†
Miss Elizabeth C. Addoms Physical Therapy Curriculum School of Education, New York University Washington Square East New York 3	†	†
Miss Mildred F. Heap Program in Physical Therapy University of Buffalo 2183 Main Street Buffalo 14	†	†
NORTH CAROLINA		
Miss Helen Kaiser Division of Physical Therapy Box 3403, Duke Hospital Durham		†
OHIO		
Miss Dorothy Spark Course in Physical Therapy Frank E. Bunts Educational Institute 2020 East 93rd Street Cleveland 6		†
OKLAHOMA		
Miss Thelma Pedersen School of Physical Therapy University of Oklahoma, Medical Center Oklahoma City 4	†	†
PENNSYLVANIA		
Miss Kathryn Kelley Curriculum in Physical Therapy D. T. Watson School of Physiatrics Leetsdale		†
Miss Dorothy E. Baethke Division of Physical Therapy University of Pennsylvania 1818 Lombard Street Philadelphia 46	†	†
PUERTO RICO (All classes given in Spanish)		
Mrs. Lutgarda Vega de Cruz School of Physical & Occupational Therapy Professional Bldg., 8th floor Stop 22, Santurce		†
TEXAS		
Miss Doris E. Porter Grady Vaughn School of Physical Therapy Baylor University Hospital Dallas 1		†
Miss Ruby Decker Curriculum for Physical Therapists University of Texas, Medical Branch Galveston	†	†
Mrs. Cecelia J. Lee School of Physical Therapy Hermann Hospital Houston 25		†
VIRGINIA		
Miss Susanne Hirt School of Physical Therapy Medical College of Virginia Richmond 19	†	
WISCONSIN		
Miss Margaret Kohli Course in Physical Therapy University of Wisconsin Madison 6	†	†
U. S. ARMY MEDICAL SERVICE		
*Physical Therapy Course Medical Field Service School Brooke Army Medical Center, Fort Sam Houston, Texas and Brooke, Letterman and Walter Reed Army Hospitals Write to: The Surgeon General Department of the Army Washington 25, D. C. Att.: Personnel Division		†

*Accepts women students only.

Please direct all inquiries regarding tuition, entrance requirements and other specific information to the school and *not* to the American Physical Therapy Association.

Abstracts

Contributions to the Physiological Action of Massage.

René Morice, Revue de Kinésithérapie, No. 52; 11-26, 1st Trimester, 1955.

Of the physiotherapeutic agents, massage is the most anciently known. Clinically, beneficial changes in the tissues become apparent following massage. The mechanical action of massage is only its secondary effect, and the principal effect which should be sought after is the modifications which are produced on the nutritive changes commanded especially by the sympathetic nervous system. Many questions still remain to be answered before massage can become therapeutic science. Problems exist such as what is the extent to which the excitant of mechanical energy transforms itself into molecular energy? What are the qualitative laws of stimuli? What are the responses of healthy and diseased tissues to mechanical stimuli? It is necessary to know how organic energy responds to the stimulation of mechanical energy brought by the hand of the masseur.

To massage is to transfer energy in the form of molecular movements in order to stimulate the vitality of the living cell by making a favorable impression on its sensitivity. The physiological response is determined by the number, pressure, duration, speed of execution and rhythm of the excitations.

The physical condition of the masseur as well as his moral and social demeanor play an inestimable role in the practice of his art. His sensitivity conditions his affinity of touch; his intuition and observations guide him in his researches by touch. The development of his tactile sensitivity can be assured by renewed exercise and the education of the proprioceptors of the palm of the hand. The masseur must be calm and disciplined during the time of treatment. Away from all distractions, he is entirely devoted to his role as a transmitter of energy. Physical, mechanical, chemical, and emotive factors from other sources must also be considered.

The excitation provoked by massage can act directly on the nerve endings of the cutaneous territory with its innumerable receivers, or indirectly by the liberation of chemical substances which diffuse and condition the general metabolism.

Massage can be at once an excitant of the organic sensitivity (excitations conducted by the nerve fibers, determining reactions of adaption to environments), or it can exercise a modifying or normalizing action of the physiochemical henomena originating in the skin and thus act as a regulator of the trophic functions of the total organism.

In this paper, Mr. Morice has attempted to summarize, for the English speaking person, the work being done in France on the physiological actions of massage. It is a fairly lengthy treatise on some of the common and of the more remote effects of massage.

Cortisone in Immediate Therapy of Apoplectic Stroke.

H. I. Russek, A. S. Russek, and B. L. Zohman, J.A.M.A., 159: 102-105, September 10, 1955.

In recent years much progress has been made in restoring the patient with cerebrovascular disease to some independence and productivity. Advances in therapy of residual paralytic defects have far exceeded gains in treatment of the acute phase.

The immediate treatment of "stroke" includes all necessary life-saving measures and careful nursing care. Aside from these, the general policy is to wait for neurological residua to disappear or subside. Occasionally attempts are made to improve cerebral circulation by the injection of some vasodilator drugs, but these are of little value. The use of papaverine has been found beneficial in the prevention of recurrences caused by vasospastic episodes. Final evaluation of the procedure of blocking the stellate ganglion has not been reached. There are also no conclusions regarding the use of anticoagulants. As yet there is no acceptable therapy for the recovery from the acute attack.

In a study of rehabilitation of hemiplegic patients it was found that the administration of cortisone diminished pain, improved psychomotor activity and motivation, and permitted early ambulation and shoulder manipulation. It was felt that cortisone might also be of value in the early stages after cerebrovascular accidents since it is active in delaying fibrosis and mesenchymal tissue response. With this retardation, nerve cells that might otherwise die from anoxia might be spared. Fifteen consecutive cases of apoplectic stroke were treated with a short course of cortisone within 48 hours after onset. Three who had a cerebral hemorrhage were not benefited, but in 9 out of 12 with cerebral thrombosis or embolism, there were striking results. There was an almost immediate amelioration of paralytic signs and symptoms and benefit from changes in mental, emotional, sensory, and psychomotor status. There was significant increase in range of motion and the ability to perform various activities. No serious difficulties were encountered from the use of cortisone in this study.

The clinical impression was that cortisone accomplished in one day what ordinarily might take several weeks with conservative treatment. Rehabilitative measures could be initiated after only one or two days because of the patient's alertness. The immediate effects of cortisone appear to be more marked in patients with more extensive lesions of the brain in which local edema plays a prominent part. There is evidence that there is a greater development of collateral circulation under the influence of cortisone.

The Measurement of Intelligence in Children With Cerebral Palsy: The Columbia Mental Maturity Scale.

Martin J. Berko, J. PEDIAT., 47:253-260, August 1955.

Most intelligence tests have been standardized upon a population having a fairly homogenous backgrounds. It is an accepted fact that environment is an important factor in I.Q. scores on various tests. The brain-damaged child, in addition to his other problems of speech, vision, manipulation, and locomotion, is handicapped on tests because of his lack of social experience. These children also may do poorly because of their emotional and psychological problems—intensified in the testing situation. Therefore, it is accepted that the Stanford-Binet Test is not valid for the cerebral palsied child and if used must be modified to account for the problems of the child.

The Columbia Mental Maturity Scale was devised with the idea of being particularly adapted for children with cerebral palsy. The test consists of 100 cards with drawings and pictures. On each card the child is asked to point to one item that differs from the rest of the items on the card. Tests for differentiation become progressively more difficult.

When 30 normal children were tested with both the Stanford-Binet and the Columbia Mental Maturity Scale, there was a close correlation of mental scores in the two tests. However, the 30 children with cerebral palsy had a lower mean score on the Columbia test. The Columbia test appears to be more valid for the cerebral palsied child in that no verbal and minimal motor responses are required. The patient's lack of normal social environment is also not as handicapping with this test. This test does, however, require visual perception, categorization, and abstraction—factors which are impaired in the child with cerebral palsy. This accounts for some of the children not testing favorably. Therefore, this test and other tests must be used with reservation in attempting to test the mental ability of the brain-damaged child.

Effects of Non-Voluntary, Electrically Stimulated Muscular Activity on Pulse Rate, Blood Pressure and O_2 Uptake.

R. C. Cogswell and W. J. Browner, J. APPL. PHYSIOL., 8:19-21, July 1955.

This study was undertaken to discover if muscles contracting because of electrical stimulation would produce changes in simply measured body functions similar to those invariably accompanying muscle contractions produced by voluntary physical exercise.

Using an electrical stimulator designed to activate muscles through an intact myoneural junction, large groups of trunk and thigh muscles were stimulated to contract rhythmically 20 times a minute in 10 subjects, for ten 45-minute periods each.

Pulse rate, blood pressure and O_2 consumption were determined regularly before, during, and after each exercise period. They showed increases during the exercise periods which were roughly proportionate to the intensity of the electrical stimulus, and consequently to the energy output of the muscle.

It was concluded that electrical stimulation of muscle in man is capable of simulating voluntary, active physical exercise. Since the subjects did not experience fatigue in the usual sense, it was suggested that, short of actual biochemical failure, such fatigue is probably more psychogenic than physiogenic in origin.

Measurement of Quadriceps Reflex in Spastic Paralysis.

Philip S. Bergman, Gerald G. Hirschberg, and Morton Nathanson, NEUROLOGY, 5:542-549, August 1955.

Since it is often difficult to distinguish clinically between a normal and abnormal "hyperactive" deep reflex, this study was made to examine their electrical characteristics.

Included in the study were 25 normal persons and 55 patients with spastic paralysis. The subjects were seated on the edge of a table with skin electrodes applied over the quadriceps femoris. The electrodes were connected to a cathode-ray oscillograph. A specially designed hammer was used to give to the patellar tendon a stimulus of uniform force. At least 60 observations were made on each person. At times the subject lifted a weight of 5 or 10 pounds, with one hand, to ascertain if this would cause reinforcement of the reflex.

The mean value amplitude of the quadriceps action potential was greater for the patients than for the normal subjects. Reinforcement of the reflex by lifting the weight in the hands significantly increased the amplitude for the normal persons, but not for the patients. This was found to be true on the involved lower extremity as well as the non-involved leg of the hemiplegia patients. Several theories are advanced to explain why the reflexes of the patients were not reinforced, but the situation is not fully understood. Another significant factor was that for the normal subjects the amplitude of the reflex potential varied considerably from one observation to another. The reflexes for the spastic patients were very much alike in amplitude and configuration.

This method of testing deep reflexes is more valid in differentiating between pathologic reflexes and the normally hyperactive ones.

Management of Cervical Disk and Cervical Arthritis Syndromes

David A. Cleveland, POSTGRAD. MED., 18:99-105, August 1955.

A large number of the disabling conditions of the arms, shoulder and neck, and many headaches, are due to cervical root irritation. The anatomy of the cervical spine is briefly outlined in this article. It is the author's opinion that cervical nerve root compression is not produced by protruding or herniating cervical intervertebral disks as frequently as believed by neurosurgeons. Rather, spur formation at the posterolateral synovial joint will compress the emerging cervical roots and result in nerve root irritation. In a similar manner, inflammatory changes may cause nerve root compression.

The symptoms, x-ray examination, and nonsurgical treatment of the "cervical syndrome" are described in detail. Traction and physical therapy generally constitute the most beneficial forms of treatment. When possible, hospitalization with continuous traction for a period of a few days to two weeks is desirable. During this time moist heat is applied to the back of the neck several times daily, and light massage is given to the neck muscles twice a day. This is followed by intermittent traction for 10 minute periods three times a week. During and following the period of intermittent traction, when the patient is ambulatory, postural exercises are extremely important.

Multiple Ruptured Lumbar Discs

Ralph B. Cloward, ANN. SURG., 142: 190-195, August 1955.

The surgical treatment of ruptured lumbar intervertebral discs is often discouraging to both the surgeon and patient, because the operation fails to relieve the symptoms of back pain and/or sciatica. In this paper, a plea is made for a more diligent search for pathologic change in multiple discs by the use of discography.

It is difficult to determine from the clinical standpoint whether the patient has only one or more than one ruptured disc. The dermatome distribution of the nerve root overlaps considerably, making it difficult to determine which root is in-

volved, and whether there is more than one. On plain roentgenograms of the spine the presence of multiple disc lesions may be suspected. Myelography will demonstrate the lesion only if the ruptured disc has herniated into the spinal canal.

The lesion most often missed by clinical, roentgenologic, or myelographic examinations is the ruptured disc without intraspinal herniation. This pathologic disc can only be demonstrated by discography. The discogram is an x-ray demonstration of the interior of the disc by a transdural puncture with a fine needle and the introduction of a radio-opaque, water-soluble dye directly into the disc.

Phantom Limbs (With Observations on Brachial Plexus Block).

W. F. T. Tatlow and J. L. Oulton, Canad. M. A. J., 73: 170-177, August 1955.

The authors present a review of the literature relating to phantom limbs and pain in both phantom limb and stump.

As part of their study they reviewed a series of 60 amputees, 53 with lower extremity and 7 with upper extremity amputations. Of the 53 lower extremity amputees, 47 reported involuntary movements of the remaining limb which continued for some time after surgery and only while sitting or sleeping. Three of the 53 denied ever having had any phantom sensations. Telescoping occurred in only 13 of the 53. Twelve of the lower limb amputees preferred to keep their prostheses on except when in bed.

Of the 7 upper extremity amputees, none had any jerkings, and only one denied ever having had a phantom sensation. All those with phantom sensations described the limb as shortened, and the position and movements resembled those described by others.

One of the authors investigated phantom limbs in 14 patients who had upper limbs removed in operations under regional anesthesia. As soon as the last sutures were placed, the patient was questioned concerning the position of the phantom extremity and shortening, telescoping or pain in the phantom part. All 14 patients had a phantom limb. Two general positions became apparent: one with the shoulder abducted, elbow in 90 degrees of flexion; and the arm across the chest or upper abdomen. In the second type, the shoulder was at 90 degrees of abduction, elbow flexed, wrist straight and the fingers slightly flexed. Shortening or telescoping was present in 8 of the 14 patients. None of the 8 patients questioned had pain in the phantom limb.

Effects of Training on Response of Cardiac Output to Muscular Exercise in Athletes.

M. E. Freedman, G. L. Snider, P. Brostoff, S. Kimelblot and L. N. Katz, J. APPL. PHYSIOL., 8:37-47, July 1955.

The results of a study utilizing cardiac catherization, respiratory function tests and a vigorous standardized exercise to investigate the cardiorespiratory effects of training on athletes are reported in this paper.

Observations were made on 3 long distance runners. No differences attributable to training were seen in the way a trained or an untrained athlete meets the tissue demands for increased oxygen during exercise up to levels requiring about 2 liters of O_2 intake per minute. The possibility that the sedentary person differs from the athlete has not been eliminated in this study, but has been made unlikely by comparison of results reported here with other reports in the literature.

The responses of both cardiac output and increased arteriovenous oxygen differences have been defined in relation to the increased need for oxygen during exercise. Pulmonary systolic, diastolic and mean pressures increased in response to all grades of exercise. The respiratory fluctuation of these pressures also increased during exercise. In both the trained and the untrained person there is an increased ventilatory efficiency in exercise compared with rest. Comparison of the total excess oxygen requirement of exercise and of the oxygen debt when one subject performed a standardized exercise in the untrained and again in the trained state showed no changes. An increased maximum breathing capacity occurred apparently as the result of training.

The possibility was suggested that chronic inflow, overload of the right ventricle might account, in part, for the incomplete bundle branch system block sometimes seen in the electrocardiogram of athletes engaged in endurance sports.

Psychological Aspects of Tuberculosis.

Sol. L. Warren, J. REHABILITATION, 21:11-13, 28-29, May-June 1955.

It is usually thought that the psychological factors of emotional stress and maladjustment weaken a person's resistance to tubercle bacilli to contribute to a case of active tuberculosis. The fact that psychological factors are as important as physical and environmental factors in the onset, treatment, and aftercare of tuberculosis must be taken into account. Those who have professional contact with the patient must be aware of his attitude and conflicts and be of assistance. His emotional reactions may have important bearing on his future course and progress.

There are three phases discussed in the psychological aspects of the rehabilitation program, namely: (1) initial reactions to the diagnosis, (2) attitude during treatment, and (3) readjustment following recovery. Many patients take the diagnosis of tuberculosis as the end, for themselves, and may react with violent anger or complete insensitive reaction. The reactions vary with the individuals, but it is quite natural for a patient to react with apprehension, indecisiveness, and depression.

The reactions to hospitalization and treatment vary widely. Many patients alienate themselves and work against any form of treatment. It is difficult to treat such patients, but as they usually are eager to return home, they sometimes become good patients for rehabilitation. Some find the hospital life, with its release from the dependencies of normal living, a refuge, and resist discharge stubbornly. This type of person may need psychiatric help. Certain types of treatment such as pneumothorax may lead to a violent reaction coupled with the fear of pain, scars, and even death. Proper management during this phase is important.

The third phase comes after discharge and is the patient's reaction to his old way of life. Some think that they will again succumb and become ill and may become hypochondriacs and malingerers. There

are others who feel that violent exercise and exertion are best after their long rest. These must be helped by indirect technics to accept the realities of their illness.

Services to Crippled Children, 1935-1955.

Edward Davens, CHILDREN, 2:139-144, July-August 1955.

State and federal programs for crippled children are guided by a basic philosophy which involves a humanitarian basis for the program growing out of a normal concern for the well being and happiness of children. The tremendous economic saving in the transformation of potentially life-long handicapped, dependent persons into useful citizens is an additional consideration.

The program should be directed toward preventive measures rather than mere salvage operations to patch up disabilities which should never have occurred. Every resource, public and private, should be made readily available. The success of the crippled children's program depends upon the degree to which it is correlated with medical and allied professional groups, voluntary health agencies, and social and educational groups.

The most consistent trend in the past 20 years has been the broadening of the definition of a crippling condition. Whereas in the past, most state programs confined themselves to orthopedic disabilities; today, projects have been developed to integrate extensive services and to include a host of new handicapping conditions. These include now, sight conservation, speech disabilities, diabetes, asthma, heart conditions, orthodontic defects and emotional problems to name but a few.

Funds, personnel, and facilities will probably always be limited in relation to actual need. Program directors and supervisors, therefore, must distribute available funds to give greatest benefit to the largest number. Dr. Davens presents a list in this paper of basic criteria or priorities for such fund distribution.

The most significant contribution of the State Crippled Children's programs has been the fight for high standards of medical care. This has paid off in terms of high qualifications of professional personnel, high standards of facilities used and availability of facilities for all children. The concept of total care directed to the whole child has been another brilliant achievement. Yet another significant result was the tendency for private agencies to adopt standards of care set up by state agencies for both treatment facilities and personnel.

Today, the team approach is the dominant trend in the organization of services. More and more states are describing plans for bringing together a group of specialists to work as a team in Crippled Children's centers. Title V of the 1935 Social Security Act opened the way for this kind of progress when it included the words: "or who are suffering from conditions which lead to crippling." Even today much remains to be done to integrate maternity care, infant, preschool and school health programs on one hand with crippled children's programs on the other. Primary preventive programs are widely established now and include pasteurization of milk, innoculation against communicable disease, and many other procedures. Secondary prevention programs face a greater challenge. These include planned and systematic application of early case-finding technics, prompt and definitive diagnosis, and arrangements for care and followup.

Crippled Children's programs still have far to go to reach the goal intended in the basic enabling legislation. The author broadens this theme by presenting an ideal definition of what a Crippled Children's program should be.

Glossopharyngeal Breathing: Ventilation Studies.

John E. Affeldt, Clarence W. Dail, Clarence R. Collier and Andrew F. Farr, J. APPL. PHYSIOL., 8:111-113, July 1955.

Seven chronic poliomyelitic respirator patients who had successfully learned glossopharyngeal breathing (GPB) were studied to observe the ventilatory aspects of this nonmechanical, independent method of breathing.

By using this technic, the group studied increased their mean vital capacity from 11 to 50 per cent of the predicted normal (using formula of Baldwin). The proficiency of GPB bears no relationship to severity of respiratory muscle paralysis. The increase in vital capacity provided a good chest and lung stretch similar to the expansion provided by the deep breaths frequently taken by normal breathers. This stretching may also improve or maintain the compliance of the lungs and thorax. A deep breath also improved the coughing ability.

Gas volume and blood-gas measurements were made before and during glossopharyngeal breathing. The ventilatory adequacy of this technic both by spot determinations and over periods of several hours was demonstrated by normal blood-gas levels and by the patient's ability to maintain his alveolar CO_2 tension at its initial level over a period of time.

One precaution must be observed in GPB and that is to limit the depth of the tidal volume. GPB is a form of positive pressure breathing and the larger the tidal volume, the greater will be the positive intrapulmonary pressure which will decrease cardiac filling. A tidal volume of 1 liter or less is considered safe.

GPB is a safe and extremely useful breathing technic. It may have application in diseases other than poliomyelitis.

Adverse Cerebral Effects of Anesthesia on Old People.

P. D. Bedford, LANCET, 2, No. 6: 259-263, August 6, 1955

The human brain is extremely vulnerable to short periods of vascular insufficiency. This is especially true in older people where cerebral circulation is already defective. It is common for older people to have post-surgical confusional states when general anesthesia has been used. Sometimes the patients have minor dementias and, rarely, even permanent catastrophic mental impairment.

During the years 1949-1954, the records were examined of 4,250 patients who were 65 years or older. Of this number, 1,193 had previously had surgery when they were each 50 years old or older. Of these surgical cases it was reported by the family and friends of 410 patients, that they had never been the same since surgery. A closer examination of the records were made of 18 of these patients. They all fitted prescribed criteria of being mentally normal prior to surgery, but showing severe dementia after their operations. There had definitely been brain damage due to one of several factors: cerebral circulatory failure, drugs,

cerebral metabolic disturbance, or arterial hypertension.

Even though brain damage during or following surgery is rare, it should be recognized as a serious problem. For when it does occur it may be irreversible. The factor of brain damage is an individual one with no single factor consistently causing it. There appears to be an individual idiosyncrasy to one or more of the factors concerned in operation under general anesthesia, which determines the occurrence of brain damage. This idiosyncrasy is both rare and unpredictable. Therefore, it is necessary to avoid the factors which may "trigger" the damage by (1) operating on older persons only when necessary, (2) avoiding potent routine medications, (3) maintaining blood pressure, hemoglobin and oxygenation at optimal levels, (4) avoiding hypotensive surgery, and (5) guarding more carefully against postoperative complications.

Poliomyelitis in Pregnancy, Fetus, and Newborn.

Talcott Bates AM. J. DIS. CHILD., 90: 189-195, August 1955.

The case report of an infant developing poliomyelitis on the second day of life is presented. An interesting discussion of poliomyelitis in pregnancy, in the fetus, and in the newborn then follows.

In the past poliomyelitis has been thought to be unusually common in pregnancy. Of the many studies reported, some authors feel that authentic data upon the increased incidence of poliomyelitis in pregnancy are still lacking. Other authors show evidence of a true increase of incidence in pregnancy. The most satisfactory explanation, so far, appears to be that pregnancy is a stress factor.

The review of literature on the effect of maternal poliomyelitis on the fetus would indicate that a normal course of pregnancy, labor, and normal offspring may be anticipated. This may be explained by the fact that the maternal antibodies crossing the placental barrier would offer protection to the fetus. Some findings, however, do show a hazard to the fetus in stillbirth and abortion.

Instances of poliomyelitis in the newborn are rare, but they do occur. It is explained that so few cases are reported because the disease is difficult to diagnose, and the diagnosis is rarely made in the absence of widespread paralysis or death. Second, there is a passive transmission of immune bodies to the young through the placenta. Third, the course of the disease may be quite different from that in the adult. Finally, the infant may be protected by a relative insusceptibility of his tissues to infection at this age.

Acute Low Back Pain.

Robert P. Kelly and J. T. Johnson, J.A.M.A., 158:1520-1521, August 27, 1955.

In order to maintain the upright posture in man, the sacrospinalis group acting to steady the cervical and lumbar curves has become quite powerful. To counteract this strong force toward hyperextension, only the rectus abdominis remains. The insufficiently used abdominal muscles are frequently not enough to avoid breakdown as a result of hyperextension. This is one of the major precipitating factors in lumbar breakdown including protruded intervertebral disk, spondylolisthesis, and the lumbosacral syndrome. The following conservative method of treatment has proved successful, particularly in this latter group.

These patients are usually in the fourth through the sixth decades of life, and have a fairly consistent history, beginning with a "catch" in the low back region, usually precipitated by some unusual torsion. There is frequently acute pain on movement, accompanied by spasm of the back muscles, possibly radiating over one buttock. The condition is aggravated by prolonged sitting or standing, and causes great pain when the patient assumes an erect position after sitting. There is marked limitation in forward and lateral flexion, and point tenderness over one or both lumbosacral joints.

Initial treatment is directed toward relief of muscle spasm. This can be accomplished by hanging the lower extremities over the edge of a table with the patient in a prone position. This position should be maintained for at least 10 minutes with the legs unsupported. Once the pain and muscle spasm have been relieved, abdominal exercises may be started. The recommended procedure is to do 30 repetitions in lots of 10 each of forward flexion of the head, neck and trunk, starting from a backlying position with the hips and knees flexed and feet resting on the floor. This maintains the desired strength and tone of the rectus abdominis muscle. In addition, patients should be instructed in proper postural attitudes.

A Rational Approach of Physical Medicine and Rehabilitation in the Low Back Problem.

Otto Fliegel and Samuel G. Feuer, COMPENSATION MED., 7:8-15, March-May 1955.

Physical therapy and rehabilitation procedures have a definite place in the treatment plan of the painful low back, especially those of traumatic origin, posture, and congenital defects, rheumatoid and arthritic disorders. These procedures are basically adjunctive in the acute phase but are of primary importance in the subacute and chronic cases. Believing staunchly in the concept of "team evaluation," physical medicine and rehabilitation can be most effective when utilized as part of a planned program prescribed by a competent physiatrist working harmoniously with the orthopedist, neurosurgeon, rheumatologist, neurologist, surgeon, family physician, radiologist, and others.

A brief outline of the major causes of backache is given and a rather comprehensive description of physical medicine and rehabilitation procedures with detailed descriptions of some special measures has been presented as well.

There have been definite failures and abuses of low back therapy which have usually resulted from such causes as the following: (1) errors in diagnosis, (2) utilization of physical therapy alone when surgical or orthopedic procedures were indicated, (3) injudicious use and improper application of physical therapy, including inadequate treatment sessions, (4) treatment at infrequent intervals, (5) treatment started too late, (6) failure to recognize malingerers, and (7) unjustifiably high expectations of "cure" and failure to recognize palliative and psychological results.

Physical medicine and rehabilitation when properly utilized, not only employ the physical forces, but are concerned with the restoration of the patient to his former physical and economic status in as brief a period as possible.

Physical medicine and rehabilitation cannot and never will be a

'panacea' for the low back problem, but the wisdom of proper diagnosis and treatment based on 'teamwork' should go a long way in encouraging better medical practice and minimizing many existing abuses.

The Clinical Use of Continuous Nebulization in Bronchopulmonary Disease.

Robert Denton, DIS. CHEST, 28:123-140, August 1955.

It is the purpose of this report to outline the physiological basis, the rationale of the technic, and the clinical experience derived from continuous nebulization. The basic mechanical principle is the addition of microscopic droplets of fluids to the inspired air. This provides special air conditioning for the control of those factors in the respiratory tract that are frequently responsible for obstruction and deficient ventilation of the lungs.

The physiological basis and objectives for this treatment are presented in detail. Several clinical applications are described. These include the treatment of bronchopulmonary infection in the pediatric age group, respiratory distress in the newborn infant, medical and surgical chest disease, and the tracheotomized patient. The composition of solutions for nebulization is discussed. The Mist O_2 Gen Nebulizer has been used in most of the cases described and has been adopted for various types of use.

Motivation of the Brain Damaged Patient.

G. Irene Greer, AM. J. OCCUP. THERAPY, 9: 156-157, July-August 1955.

Motivation is a psychological state of readiness in the desire to expend energy and achieve a goal. A patient may be strongly motivated to do one thing but not another. He may strive to learn to talk but not to walk.

Motivation of a brain damaged patient is a particular problem. He may have not only serious residual handicaps, but emotional problems as well. What part of his behavior is organically uncontrollable and what part is personality deviation due to stress is always a difficult question to answer.

It is necessary to recognize the limitations of patients' psychic resources, as well as differences in their basic personalities. Each patient will have his own abilities, limitations, and emotional problems. To each one, the approach must vary. In addition to the desire to help him, the therapist must have the emotional stability and knowledge to motivate the patient in his efforts to improve his condition.

Treating the "whole patient" must be practiced and not just spoken. The patient should be met where he is and stimulated to do his best. What his limitations are may not easily be answered—particularly at first. But, if the therapist approaches the patient in a manner sensitive to his needs, there will be a greater chance of succeeding in the attainment of the maximum goal. Like any other skill or art, it takes practice and sincere effort. As a team, the patient and therapist should work together in striving to plan a realistic program. Both need to recognize the limitations and the possibilities of achievement. For the patient, constant encouragement is important. Without motivation, rehabilitation is aimed not at creative living, but only at existence.

The Respiratory Function of the Laryngeal Muscles.

J. H. Green and E. Neil, J. PHYSIOL., 129:134-141, July 1955.

During an examination of impulse activity in efferent vagal fibers, it was noticed that many fibers showed a discharge coincident with inspiration. These fibers were traced to the recurrent laryngeal nerve. This observation was followed by an investigation on anesthetized cats of impulse activity of this nerve, and electromyographic studies were also made of the intrinsic muscles of the larynx.

The recurrent laryngeal nerve contains fibers which show an outburst of impulses during inspiration. The onset of activity in these fibers just precedes that in the motor neurones of the phrenic nerve. The inspiratory discharge of these fibers is reflexly inhibited by artificial inflation of the lungs. The afferent fibers of this reflex are vagal.

The abductor muscles of the arytenoid cartilages of the larynx show activity on the electromyogram during inspiration. Artificial inflation of the lungs reflexly abolishes such activity.

The recurrent laryngeal nerve also contains fibers which show an impulse traffic during expiration. The expiratory discharge of these fibers is reflexly accentuated by artificial inflation of the lungs.

The adductor muscles of the arytenoid cartilages of the larynx show activity during expiration. Artificial inflation of the lungs reflexly increases such activity.

Poliomyelitis and Tonsillectomy, A Report of the Medical Research Council Committee on Innoculation Procedures and Neurological Lesions.

LANCET, 2, No. 1:5-10, July 2, 1955.

Studies were made in England and Wales between 1951 and 1953 to determine if there was a positive relationship between tonsillectomy and poliomyelitis.

The first data were collected on patients with poliomyelitis who had had their tonsils removed within 3 months prior to onset of symptoms. Of this group of 103 patients, 34 had spinal paralysis, 29 with combined spinal and bulbar, 27 bulbar only, and 13 nonparalytic poliomyelitis. Of all the patients 59 per cent had their operations within 1 to 21 days prior to onset of poliomyelitis. The concentration was most evident in the bulbar and bulbo-spinal groups where 79 per cent had recent (0 to 21 days) operations. This pattern prevailed regardless of sex, age or seasonal distribution. This presents a real individual problem, for there appears to be a relationship between tonsillectomies and poliomyelitis. Postponement of the operation to a nonepidemic season may not prevent the disease and also increase the risk of intercurrent infection.

Additional data were collected to confirm the connection between poliomyelitis and tonsillectomies. There were 203 patients between ages 5 and 15 years who had poliomyelitis. As matched controls, there were an equal number of children of similar age, sex and social status. Out of the groups, 35 per cent of the patients had undergone surgery and 22 per cent of the controls. The greatest difference was between the bulbar paralysis group of patients and their control children. Here 55 per cent of the patients had had tonsils removed — but only 18 per

cent of the control group. The tonsillectomies were not necessarily recently done. In the bulbar and bulbo-spinal groups, most of the children had had their tonsils removed at least 1 year before the onset of poliomyelitis. The explanation for the association between tonsillectomy and bulbar and bulbo-spinal poliomyelitis is not fully explained, but it must be concluded that the removal of tonsils was responsible for some children acquiring the disease.

An Electromyographic Examination of the Role of the Intercostal Muscles in Breathing in Man.

E. J. M. Campbell, J. PHYSIOL., 129: 12-26, July 1955.

The intercostal muscles were examined electromyographically using surface electrodes in healthy young men, in women after radical mastectomy, and in dypsneic patients. The intercostal muscles of one young man were examined simultaneously with surface and needle electrodes.

The muscles were found to contract in the lower (sixth, seventh, and eighth) intercostal spaces of most subjects in inspiration during quiet or slightly increased pulmonary ventilation.

The intercostal muscles did not contract during expiration in quiet breathing or considerable hyperpnea. In these circumstances they were less active than the muscles of the abdominal wall.

They contracted during voluntary expiratory efforts.

The activity of the intercostals was more difficult to detect in the upper (second, third and fourth) than in the lower (sixth, seventh and eighth) intercostal spaces. This difference may have been due to any or all of the following factors: the greater depth from the surface of the skin to the muscles in the upper spaces; less activity in the intercostal muscles of the upper spaces; smaller motor units in the intercostal muscles of the upper spaces.

In some subjects, the inspiratory contraction of the lower intercostal muscles was increased in the erect posture.

No data were obtained which supported the distinctions often made between the actions of the external and internal intercostals.

A review of the literature did not reveal adequate evidence from which the functions of these muscles could be inferred with certainty. It is suggested that during the involuntary breathing they are inspiratory in function, but they probably facilitate voluntary expiratory efforts and such activities as coughing.

A New Scale for Evaluating Disability in Multiple Sclerosis.

John F. Kurtzke, NEUROLOGY, 5: 580-583, August 1955.

It has been difficult to evaluate therapies in multiple sclerosis, because of the unpredictable course the disease takes and due to the absence of a means of measuring disability. At present there is no generally accepted scale.

To obtain a scale of value, three points must be included, that is, (1) there should be a suitable category to include the subtotal of any patient's disabilities; (2) if there are changes in disability, they should be reflected in a corresponding change of status; and (3) the scale should be simple enough to be manageable.

A new classification of disability in multiple sclerosis is presented with a status number included, according to the patient's impairment due to neurologic dysfunction. The scale is made up of 10 classes of progressive steps and has proven satisfactory in the study of over 300 patients during their hospitalization and in measuring any change in the status of these patients. Each status is numbered 0 to 10, as follows:

0 — *Normal Neurologic Examination*—This comprises the normal, but includes those with temporal pallor and normal visual acuity, those with paresthesias but no sensory defect, and those with symptoms unsubstantiated by signs.

1 — *No Dysfunction, Minimal Signs* (Babinski, diminished vibratory sense)—These patients have no symptoms, but the neurologic examination is not normal.

2 — *Minimal Dysfunction*—These patients have signs and symptoms that do not affect usual function, yet they show slight weakness or stiffness, mild disturbance of gait, awkwardness, mild visuomotor disturbance.

3 — *Moderate Dysfunction* — Patients have a combination of minor dysfunctions or one severe symptom as monoparesis; others are mild hemiparesis, moderate ataxia, disturbing sensory loss, or prominent urinary and eye symptoms.

4 — *Relatively Severe Dysfunction*—The patient's disabilities must be such that he can work or do housework, be up about 12 hours a day, and carry on normal activities of living, excluding sexual function.

5 — *Dysfunction Severe Enough to Preclude Working*—The patient must have maximal motor function, such as ability to walk unaided up to several blocks.

6 — *Assistance Required For Walking*—This classification is for those who walk with canes, crutches and braces.

7 — *Wheel Chair Patient*—He must be able to wheel self and enter and leave chair alone; for example, a paraplegic using double long-leg braces, and two crutches.

8 — *Restricted to Bed, but with Effective Use of Arms*—This patient is usually able to feed himself and perform part of his toilet.

9 — *Totally Helpless Bed Patient.*

10 — *Death due to Multiple Sclerosis*, or its primary complications.

Among 315 patients studied only 7 were found whose symptoms were due solely to disturbance of head segment functions. Of these 7, 5 had retrobulbar neuritis, and 2 had normal visual functions. Patients may be classified even if they have only optic manifestations.

It is not claimed that the scale provides an arithmetical progression of disability, that is, status 4 is worse than status 2, but it is a means of matching disabilities, to mark the course of a single patient, or to compare groups of patients. This scale may be used for other neuromuscular disorders.

Multiple Sclerosis and the Local Weather.

Carl E. Hopkins and Roy L. Swank, ARCH. NEUROL. AND PSYCHIAT., 74: 203-207, August 1955.

Many papers have been written on the influence of weather on multiple sclerosis. This present study undertakes to find out what specific climate factors significantly influence the course of the disease.

The findings of this study do not

support the gross clinical impression that multiple sclerosis episodes are more frequent during the month of January or in the spring, or in any other particular month. However, the day to day temperature range shows a low but significant positive correlation with multiple sclerosis episodes. Furthermore, these findings tend to support the frequent observation that patients with multiple sclerosis suffer increased disability in periods of rapidly changing weather, which may be either unusually warm or unusually cold. Therefore, it is suggested that further study might reveal some small advantage to be obtained by having a patient adopt clothing, housing, and activity habits designed to stabilize his heat loss and to prevent sudden changes in this respect.

Rehabilitation of the Patient with Myocardial Infarction.

Jerome Kaufman and Marvin C. Becker, GERIATRICS, 10:355-361, August 1955.

Several authorities disagree on the part that strenuous effort plays in causing a coronary occlusion. Ordinary effort to which a patient has been accustomed is not indicated as a cause of coronary occlusion or as a factor aggravating the course of the disease. A rehabilitation program should be organized with these facts in mind.

Rehabilitation of the patient with myocardial infarction is divided into three parts: attack, convalescence, and return to work. Shortly after the acute episode, the services of the psychiatrist, the psychiatrically-oriented internist, and the physical therapist are of value. Graded exercise and occupational therapy during the weeks in bed help prevent anxiety and preserve and restore muscle and vasomotor tone.

During the convalescent stage the patient is discharged when ambulant and remains at home for a month or two before returning to work. During this time the patient is allowed to climb stairs in a leisurely manner.

After convalescence, when the patient is considered able to return to work, an evaluation of his disability and the job should be made. Sheltered workshops are of value to the elderly unskilled disabled cardiac. Assistance in gaining employment may be obtained through local heart associations, state divisions of vocational rehabilitation, employment services, and other local and national agencies. There is a need for uniform compensation laws and also for education of industry to employ persons in this group.

The Function of the Erectores Spinae Muscles in Certain Movements and Postures in Man.

W. F. Floyd and P. H. S. Silver, J. PHYSIOL., 129: 184-203, July 1955.

The action of the erector spinae muscles in the lumbar region was studied in 150 human subjects by electromyographic technics with surface electrodes and concentric needle electrodes. Posture was recorded by photography, by measurement of the pelvic inclination, and by radiography of the lumbar vertebrae and sacrum.

Most subjects showed a low level of discharge in the erector spinae muscles in the upright position. Small adjustments of the position of the head, shoulders or hands could be made so as to reduce this resting discharge to a minimum or zero.

From the upright position, extension of the trunk is usually initiated by a short burst of erector spinae muscle activity and controlled by the rectus abdominis muscle. Flexion of the trunk from the position of extension is initiated by a burst of activity in the rectus abdominis and then controlled by the erector spinae.

In the upright position the contralateral erector spinae muscle contracts in lateral flexion of the trunk except when the initial position is one of extension, when the erector spinae are relaxed throughout the movement.

The erector spinae contract synergically in straining and coughing whatever the posture of the trunk.

In full trunk flexion the erector spinae relax completely ("flexion-relaxation of the muscle"). "Flexion-relaxation" occurred in 116 out of 150 subjects. Of the remaining 34, various pathological conditions prevented relaxation.

"Flexion-relaxation" also occurs in weight lifting with the trunk fully flexed.

The mechanisms of trunk flexion and "flexion-relaxation" are discussed. With increasing flexion there is increase of tension in the intervertebral ligaments until the flexed trunk is supported by the ligaments, at which point the erector spinae relax. The mechanisms by which the relaxation is achieved are unknown. It is not a muscle lengthening reaction nor a reflex inhibition from intervertebral ligaments.

These findings explain the observation that rupture of the annulus fibrosus and other intervertebral ligaments commonly occurs in trunk flexion.

Book Reviews . . . . .

How Far Is It To Bethlehem. *By Elizabeth Orton Jones. Dedicated to the children at Crotched Mountain Rehabilitation Center, Greenfield, New Hampshire. Hard Cover. Price $1.50. Pp. 38; illus. Horn Book Co., Boston, 1955.*

In a short and memorable story the desire of the children of Crotched Mountain Rehabilitation Center in Greenfield, New Hampshire, to give a Christmas play as an expression of their gratitude "because so much has been done for us" is told with quiet humor, charm, and a poignancy that is indeed moving.

The author in a deeply impressive manner describes the identification of each participant with his role — all physical handicaps for the moment forgotten — as the "actors" on a Sunday just before Christmas present their interpretation of the Nativity scene. During these magic moments braces, crutches, wheel chairs and the cares of their daily lives seem to be relegated to another existence as, no matter what their mode of locomotion, they travel the road to Bethlehem.

More than merely another Christmas episode this little tale recaptures for the reader warm memories of childhood reactions to the beauty and wonder of the Nativity story, as well as being a reminder of how the ability to participate actively in reproducing such an experience is so often taken for granted. The closing sentences of the book remind us that the very "least of these my brethren" can be the force to lift us up to the peace and love we are so desperately trying to find. Persons working directly with children will be profoundly impressed by the way these children, at least temporarily,

forget their afflictions and their differences from other people. The story has a very real message and the book makes a thoughtful gift at any time of the year for persons of all ages and backgrounds.

The author is well qualified to write the story for she has spent many hours with the children at Crotched Mountain and has contributed additionally to their fun and enjoyment through the fairy land murals she has painted on the hospital walls. She has also designed the format and drawings for the book.

Living Bone in Health and Disease. *By Irvin Stein, M.D., F.A.C.S., F.I.C.S., Assistant Professor of Orthopedic Surgery, University of Pennsylvania; Chief, Orthopedic Surgery, Philadelphia General Hospital, Albert Einstein Medical Center, Philadelphia; Diplomate, American Board of Orthopedic Surgery; and Raymond D. Stein, M.D., F.I.C.S., F.A.G.A., Associate, Hahneman Medical School; Chief Orthopedic Surgeon, Doctors Hospital, Sidney Hillman Medical Clinic; Assistant Chief, Philadelphia General Hospital; Associate, Albert Einstein Medical Center; Diplomate, American Board of Orthopedic Surgery. Cloth. Price $10.00. Pp. 510; illus. J. B. Lippincott Company, Philadelphia, 1955.*

Dr. Irvin Stein has for many years been interested in the biological processes of bone. He made a study of Paget's disease, von Recklinghausen's disease, myositis ossificans progressiva, and other bone diseases including rickets.

This book is a textbook of clinical value and brings in all the scientific advancements that have been made through modern research. There is a direct clinical application of basic scientific knowledge.

The first part of the book deals with structures, function, and reactions of normal living bone. The second part is concerned with specific diseases, some of which are due to developmental faults, others due to endocrine disturbance; some related to mechanical disturbance or defects in the calcification of the matrix, others due to too much vitamins A or D. It includes the lipoid granulomas, inflammatory reactions, neoplasms and Paget's disease.

The third part of the book deals with a method of classifications of bone diseases accompanied by a series of tables in which a space is left for the unknown factors.

The text is profusely illustrated with excellent reproductions of roentgenograms. The paper and type are good and the material is arranged so that it is easily read.

The authors present an excellent treatise of the anatomy and physiology of bone, bringing in the modern concepts of bone growth and bone repair. The clinical application to diseases of the bone make it a reference book of practical value.

Physiology and Anatomy. *By Esther M. Greisheimer, Ph.D., M.D., Professor of Physiology, Temple University School of Medicine, Philadelphia; Formerly Professor of Physiology, Woman's Medical College of Pennsylvania; Formerly Associate Professor of Physiology, the University of Minnesota. With the assistance of Ann A. Miraldo, R.N., B.S., Science Instructor, Temple University School of Nursing. Cloth. Price, $5.00; Pp. 868. J. B. Lippincott Company, Philadelphia, 1955.*

This textbook of physiology and anatomy has been rewritten and reset in the seventh edition. With the idea of ease of teaching and learning in mind the entire text has been revised.

This text is unique in combining accurate and complete information regarding both structure and function. The structure of each system is given first, and complete information regarding the function of that system follows immediately. Such an arrangement makes this an extremely valuable book for teaching physiology to a class of students whose backgrounds are as varied as we sometimes find in occupational and physical therapy classes. It can easily be adapted for those who prefer to teach the function of a system before teaching the structure of that system.

Practical considerations which correlate the material directly to medical conditions are included in each section. Although these considerations are directed to the student nurse they are applicable to the therapy student as well.

A few pages on combining forms and prefixes should be of definite value to the student. A selected list of up-to-date references on physiology, general anatomy, developmental anatomy, neuroanatomy, applied anatomy and microscopic anatomy is included. The glossary is concise but complete.

Excellent pictures and diagrams add to the ease of understanding both structure and function. In the section on muscles a chart is included which gives the origin, insertion, action, and nerve supply of each muscle of the body. There are other charts and tables which are of great value as teaching aids on such subjects as: the composition of blood, function of cranial nerves, the vascular system, function of digestive juices, etc.

The author writes in a readable, logical style. Each chapter is well organized as follows: content of chapter, presentation of material, practical considerations, summary, and situations and questions set up for students to answer as a review. This is a practical and informative reference book for anyone interested in anatomy and physiology and should prove to be an excellent text for students.

Studying Your Community. *By Roland L. Warren, Professor of Sociology, Alfred University; Co-Director of the Alfred University Area Study. Cloth. Price $3.00. Pp. 385. Russell Sage Foundation, New York, 1955.*

With increasing emphasis on the importance for lay participation in the planning of community services there has existed the need for a manual for laymen to assist them in studying their community, as a necessary first step in such participation. The author has provided such a manual.

Essentially the book consists of a series of chapters each of which is devoted to a particular aspect of community life. There are chapters on the community's economic life, government, politics, law enforcement, community planning, housing, education, recreation, religious activities, health, etc. Practically every phase of community life is included. Each area is introduced by a general description of some of the present day problems. The area is then subdivided into more specific subareas, which are briefly discussed in a general manner. This is followed by a series of questions, answers to which will furnish a picture of the community activities in this area. For example, the discussion of health covers health background factors, health personnel, hospitals, public health services, communicable diseases, chronic diseases, paying for medical care, voluntary health organizations, and mental health. The discussions and questions seem to

cover the subject thoroughly and comprehensively.

In addition to discussing these specific phases of community life there are chapters devoted to methods of organizing a community survey, and a review of aids to such a survey. It also contains many footnotes and references and suggestions as to how particular types of information can be obtained.

The volume is well written and readable. It will no doubt be useful to community agencies who are concerned with stimulating general citizen interest in community affairs; however, the scope is so comprehensive that the subject matter will have to be interpreted for lay groups by professional workers.

Anterior Poliomyelitis. *By Lewis J. Pollock, M.D. Paper. Price—Free. Pp. 64; illus. National Foundation for Infantile Paralysis, New York, 1954.*

This booklet discusses a small area of anterior poliomyelitis—the long controversial and confused topics of etiology, pathology, and significance of so-called "muscle spasm." Dr. Pollock's extensive research in neurophysiology and in clinical studies well qualifies him to question the overemphasized position muscle pain and stretch pain have received in poliomyelitis care. A selection of the pros and cons from the experimental and clinical literature is presented together with studies and observations by the author to make a case for a better rationale of this syndrome. The booklet is written in a positive but haphazard manner and contains graphs of studies and illustrations of some clinical features seen in other conditions. The issues presented are worthwhile, but the organization and technic of developing them are scattered and leave much to be desired.

The author shows that the already defined entities of spasm, spasticity, tetany, rigidity and associated reflexes are not seen in acute poliomyelitis. Nuchal rigidity and the Kernig, Lasègue and Brudzinski signs that are present in meningitis are also present in poliomyelitis, but to a lesser degree and in a slightly different form. Muscle pain and stretch pain are seen, and in paralytic cases these appear after paralysis has been established. Myostatic contracture occurs.

Experimental and clinical data are presented giving several opinions as to the cause and degree of these symptoms. The author does not feel that the nuchal rigidity, muscle pain, and stretch pain are of sufficient significance to warrant the extraordinary amount of attention and the practice of useless and possibly detrimental routines that they have often received.

The subject of more intelligent treatment of poliomyelitis, which seems to be the author's aim for writing, is dropped without constructive suggestion—"in the conventional case there is no need to boil or curarize the patient." The reader must choose the best application to the treatment situation, which most authorities feel lies between the extreme criticized and the negative presented.

This theoretical discussion does well to stimulate reevaluation of accepted theories. It should be of particular interest to the physician, nurse and physical therapist associated with the clinical management of poliomyelitis.

Medical Progress: 1955. *Edited by Morris Fishbein, M.D., Clinical Assistant Professor of Medicine, University of Illinois College of Medicine, Chicago; Consultant Editor, Postgraduate Medicine; Medical Editor of Britannica Book of the Year; and contributors. Cloth. Price $5.00. Pp. 346. McGraw-Hill Book Co. New York, 1955.*

This edition is the third in a series of annual reviews designed to cover recent advances in the general field of medicine and its specialties. A total of 28 well qualified physicians and surgeons have prepared the 20 different sections of this volume. The topics covered include gastroenterology, surgery, obstetrics, cardiovascular diseases, psychiatry, allergy, diabetes, and several others including a chapter on new drugs.

Due to the attempt to cover such a broad field, some of the chapters are of necessity somewhat sketchy. In addition, due to the multiplicity of authors, there is some overlapping of subject material, and two authors may discuss the same topic from somewhat different points of view. This is not considered a disadvantage, however, since much of the value of this book lies in offering the different contributors' personal experience and comments regarding the newer developments in their areas of interest.

The most important purpose of books of this type is the presentation, in a single convenient source, of an outline of the more important recent advances in medicine for the benefit of the busy general physician, as well as for workers in more specialized areas of medicine. The value is enhanced considerably by the inclusion of over 1,500 references to current literature. The pertinent references are included at the end of all but two of the sections, and thus present a convenient source for further reading. In addition, there is a good subject index for ready reference.

This book will be particularly useful to the general physician. It also may be expected to be of interest to those requiring a bibliography of selected topics from the current literature as well as those working in specialized areas of medicine.

Essentials of Biological and Medical Physics. *By Ralph W. Stacy, Ph.D., Associate Professor Laboratory of Biophysics, Dept. of Physiology, Ohio State University; David T. Williams, Ph.D., Physicist, Battelle Memorial Institute, Columbus, Ohio; Ralph E. Worden, M.D., Associate Professor Physical Medicine and Rehabilitation, College of Medicine, Ohio State University; Rex O. McMorris, M.D., Associate Professor and Chairman of Dept. of Physical Medicine and Rehabilitation, University of Louisville Medical School. First Edition. Cloth. Price $8.50. Pp. 586; illus. McGraw-Hill Book Co., New York, 1955.*

The authors state, in their preface, that there were no existing textbooks for biophysics and that this book was written expressly to fill this void. Therefore the principles set forth in this book had to be stated afresh; from material gathered from monographs, research reports, and other sources.

Their definition for biophysics was taken from the late Dr. Laufborrow and encompasses three fields of endeavor. These are (a) the use of physics to explain biological phenomena, (b) study of the effects of physical environmental agents on biological material, and (c) the use of physical instruments and technics to study biological systems.

The book is well arranged for a textbook, being divided into eleven main parts, each including two to eight chapters. Each chapter is followed by lists of general and specific references so each chapter or part can be used separately. Each sec-

tion or part ends with a chapter dealing with the application of the principle discussed in that part.

There are three main sections of particular interest to those in the fields of physical medicine and physical therapy: Part II, Mechanical Biophysical Systems, dealing with cells, tissues, bones, muscles, the mechanical engineering of the body and medical aspects of musculoskeletal engineering; Part III, Heat and Thermodynamics in Life, ending with a chapter on the application of heat in therapy; Part VIII, Electrical Systems in Biology, ending with a chapter on electrodiagnosis, electrotherapy and diathermy.

The book is well illustrated and contains many graphs and formulas to further explain the text. It is well and interestingly written. It should be an excellent review for the physical therapist now in the field and could be used to good advantage as a supplementary text, at least, in physiology for the student.

Physical Education for Children. A Handbook of Objective Activities. *By D. Cyril Johnson, Diploma, Carnegie Physical Training College; Lecturer, Health and Physical Education, Monmouthshire Training College. Illustrated by Margaret Brogden. Cloth. Price $4.75. Pp. 215. Philosophical Library, New York, 1954.*

This compact text has been written as a "handbook of objective activities" for teachers concerned with children ranging from five to eleven years of age. The English author fully appreciates the importance and value of directed purposeful physical activities in the development of neuromuscular skills at an early age It is interesting to note the emphasis placed on the use of small and accessible equipment to accomplish this end.

The concentrated wealth of material pertaining to functional activities, whether it be for motility activities, functional exercises, or group work, should inspire any teacher concerned with the responsibility of physical development at this age level. The illustrations animate the descriptions of activities and are well done.

The value of this book to a physical therapist would seem to lie only in its possible usefulness as a source book from which activities might be adapted to fit the needs of handicapped children.

The reviews here published have been prepared by competent authorities and do not represent the opinions of the American Physical Therapy Association.

Our Book Reviewers for December

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Supracondylar Fractures of the Femur. E. L. Jewett, F. D. Stanford, W. R. Willis and L. P. Brady, J. Internat. Coll. Surgeons, 24:137-143, August 1955

The Present Status of Intramedullary Nailing of Long Bones. P. G. Costigan, Canad. M. A. J., 73:178-180, August 1, 1955

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The Early Care of Patients with Injury of the Spinal Cord. John Martin and Iris Craig, Am. J. Nursing, 55:936-939, August 1955

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Dead Space at Rest and During Exercise. Allen C. Young, J. Appl. Physiol., 8:91-94, July 1955

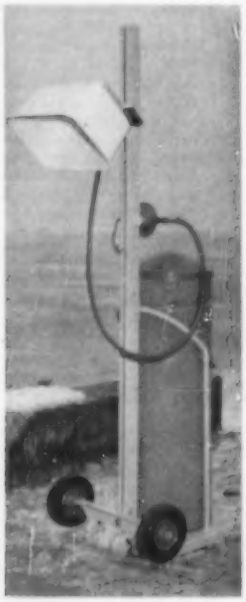
The Nature and Treatment of Parkinsonism. Sidney K. Shapiro, J. Lancet, 75:329-333, August 1955

What's New . . . . . .

For more information on items write to The Physical Therapy Review, 1790 Broadway, New York 19, N. Y.

New items which may be of interest to physical therapists will be mentioned in these pages each month. The accompanying explanations are made by the manufacturers and have not been investigated by the *Physical Therapy Review*.

201. Therapeutic Heat



Now in production is a new infra-red radiant gas heater. Developed in Germany, the Infra Rayhead Heater has been in wide use in Europe for the past two years. It operates on any kind of gas—manufactured, natural or liquefied petroleum. And it may be used anywhere, indoors or out. It is planned to make these heaters in a variety of sizes, including one 12,000 B.t.u. unit which will heat sun porches, patios, lodges, and cabins, as well as provide therapeutic heat. Perfection Stove Company.

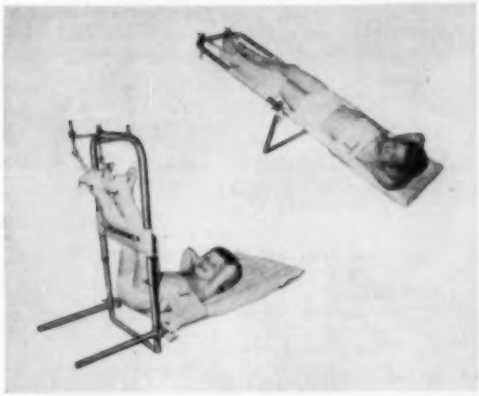
202. Snip-ups

Giant hardwood scissors (31 inch) aid any seamstress, shut-in, or "lazy bones" in retrieving elusive pins, papers, scraps. Magnetic tip collects metal objects easily. For someone who appreciates a prank with practicality. Smooth ebony finish. Grace Shirley Interiors.

203. Wire Art

Suji is a creative art form now being used as part of physical therapy and rehabilitation programs in hospitals. By following directions and employing jigs, tools and quick-drying cement, anyone can become a Suji Sculptor, the manufacturer says. Suji wire is practically fool-proof craft material. If mistakes are made, they can be undone by unwinding the wire and beginning again. X-Acto, Inc.

204. Children's Traction Frame



Dual purpose traction frame, said to reduce circulatory complications in children treated for fracture of femur in Bryant's traction, has been developed. Frame can be used for suspension traction in treating children 2 to 4 years old, or for extension traction for older children. Easy conversion from suspension to extension traction. Orthopedic Frame Co.

205. Plastic Padding

206. Folding Table

The Versa-Table, designed by Karoff, was created to fill the need for modern equipment which has versatile uses, yet does not add to the already crowded space problems of most hospitals. This medium priced, all metal table folds flat in two seconds, in a single motion, to a depth of only 2¾ inches. It becomes shelving when half closed, or a portable nurse's desk when the lower shelf is turned back. It rolls smoothly in both folded and in-use positions. Self Ease Units, Inc.

☆

(*Left*) Durocel, porous plastic product resembling foam rubber, can be used for casts. Said to be nontoxic, nonallergic material that can be washed, boiled, and autoclaved. Product comes in roll for..., elasticity permits good wrapping job around knuckles, ankles, knees, and ribs. Material supplied in rolls of 2", 3", 4", 6" and 12" widths, each of 72" length. Zimmer Manufacturing Co.

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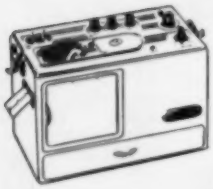

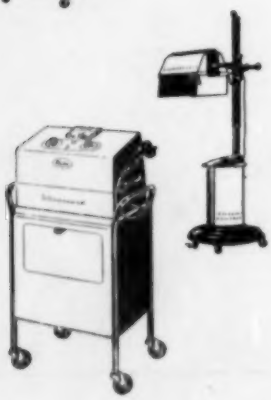

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